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Part 3

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Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH
FARMERS' COOPERATIVE DEMONSTRATION WORK.
Washington, D. C.

WINTER GARDENS.

NEED FOR WINTER GARDEN. Every southern garden should have a supply of lettuce, spinach and radishes throughout the fall and winter and spring, as they can be easily grown and form valuable additions to the usual dry, winter diet. With more of such food products in the diet, there would be less use for spring tonics and other medicines. In addition to this, these food products are palatable and serve to lower the cost of living.

These crops attain their best development on a sandy loam soil well supplied with humus or decayed vegetable matter. All of them thrive best during the late fall or early spring and will not withstand the heat of summer. In all sections of the lower south, lettuce, spinach, and radishes can be grown in the open throughout the fall, winter and spring. In the more northern of the southern states and in high altitudes these crops can be grown in fall and spring in the open and during the winter in hot beds or cold frames.

SIZE. It is suggested that club members who begin winter gardens take a plot of well prepared land 50 ft. long and 20 ft. wide. This is one-fourth of the tenth acre garden. On the rest of it a winter over crop may be planted.

		VARIETIES TO BE PLANTED. About four vegetables should be planted, the varieties chosen being those not commonly grown in the home garden so as to give the demonstration special value to all, and furnish new vegetables for the table. This letter contains instructions for spinach, lettuce, and radishes, prepared by Mr. H. C. Thompson of the Horticultural Division. These can be grown in winter gardens all over the south. The County Agent will suggest another vegetable of special interest in her county. In many sections cauliflower will be added. Where good markets can be obtained, the area may be increased.	
20 ft. x 20 ft.	Spinach		
20 ft. x 20 ft.	Cauliflower and cabbage or other crop.	HOME DEMONSTRATION WORK. Instructions will be sent for preparing these vegetables for the table, for canning the surplus spinach, and for brining the surplus cauliflower to be used later in mixed pickles.	
10 x 10	Lettuce	10 x 10	Radishes
		PLANTINGS. In order to have lettuce and radishes throughout the season, it is advisable to make sowings of seeds every two or three weeks. As soon as the crop is removed, another crop should be planted. The radish seed might be sown between the rows of lettuce if hand cultivation is to be given. The radishes would be harvested before the lettuce reached sufficient size to crowd. By making two sowings of spinach, one in the fall and another in late winter or early spring, a continuous supply can be secured.	

Plan for Winter Garden.

LETTUCE. In growing this crop in the open or in hot beds and cold frames, the best results can be secured by sowing the seed in a well prepared bed and transplanting the young plants. Sow the seed thinly in drills 4 to 6 inches apart and cover about ½ inch deep. For the best results, transplant the young plants as soon as they form the first true leaves. Set these plants in a cold frame 2 inches apart each way and as soon as they reach a height of 1½ to 2 inches, take up the plants with a trowel or spade and set to the permanent bed. If planting in the field, set the plants 8 to 10 inches apart in rows 14 inches apart. When transplanting to frames, the plants should be set 8 to 10 inches apart each way. Lettuce seed is sometimes sown in rows in the field and the plants thinned out to stand the proper distance.

The soil for lettuce should be thoroughly prepared as very little cultivation can be given when the plants attain considerable size. While the plants are small, the soil should be cultivated to keep down weeds and prevent a crust forming. In the frames a hoe or hand weeder can be used, while in the open a wheel hoe can be used to good advantage.

There are two general types of lettuce, loose leaf and the heading types. Of the loose leaf types, the Grand Rapids and Black-Seeded Simpson are among the best varieties,

while the Big Boston is the best variety for market of the head type. For home use the Hanson or California Cream Butter might be grown as they are of better quality than the Big Boston. The markets of the east demand a hard head lettuce of the Big Boston type, but the markets of the central use more of the loose leaf lettuce. Unless growing for local market, however, it is best to grow the headed type because large quantities of the other kind are grown under glass in the central states.

SPINACH. Spinach can be grown in the open in all sections along the coast from Norfolk, Va., south and in practically all sections of the lower tier of southern states. In the colder regions of the south, this crop can be grown in the open with a little protection or in canvas covered cold frames throughout the winter.

The soil should be made fairly rich. Well rotted manure is the best fertilizer but if this is not available, apply at the rate of 50 to 100 pounds of a high grade fertilizer per tenth acre. Sow the manure or fertilizer broadcast and thoroughly harrow it into the soil. Five ounces of seed will make two plantings on the plot 20 ft. square in drills 10 to 12 inches apart. Thin the plants out to stand 3 or 4 inches apart. Frequent shallow cultivation by hand or with a wheel hoe should be given. When grown in frames, the cultivating must be done by hand. In most sections of the south, however, spinach can be grown in the open without any protection, as a hard freeze causes very little injury.

The variety of spinach most commonly grown is the Savoy. At Norfolk, Va., the large truckers grow a strain of this variety called the Norfolk Savoy.

RADISH. Radishes should be grown rapidly to insure good table qualities. The soil should be fertile and contain abundant moisture. Fresh stable manure should not be used however as it would produce excessive leaf growth. Well rotted manure is the best fertilizer and should be applied at rate of about 2 tons per tenth acre. If no manure is available, apply at the rate of 100 pounds per tenth acre of a good grade complete fertilizer.

Sow the radish seed in rows 12 inches apart in the field and cover $\frac{1}{2}$ to 1 inch deep, depending upon the soil. On light, dry soil, cover 1 inch deep and on heavy moist soil, cover $\frac{1}{2}$ inch. When grown in hot beds or cold frames the rows of radish need not be more than 4 to 6 inches apart or just wide enough for hand hoeing and weeding.

There are three types of radishes, turnip-shaped, olive-shaped, and long. Of the turnip-shaped, the best varieties are the Scarlet Globe and Scarlet Turnip. The best of the olive-shaped are the French Breakfast and Early Scarlet. The Charter Long Scarlet, Long White Spanish and Icicle are the best varieties of the long type.

Where protection is needed for growing these crops, a canvas covered frame will serve the purpose. If, however, a glass covered hot bed or cold frame is available or will be needed for starting other plants, it is advised to use it. In growing any of these crops in frames, close attention must be given to watering and ventilation. It is best to apply water to the soil between the rows rather than sprinkling over the plants after they attain considerable size. This is especially to be recommended for lettuce.

For information on construction and management of cold frames, and hot beds, read letter No. 543.

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U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
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FARMERS' COOPERATIVE DEMONSTRATION WORK.

USE OF VEGETABLES FROM WINTER GARDEN.

Instructions have already gone out for the winter garden and this letter simply follows up that one that you may know the many ways of using the vegetables suggested to be planted in the winter garden. Also the methods for taking care of any surplus you may have.

SPINACH.

Spinach gives a variety to winter diet when most other green vegetables are expensive and of inferior quality. Spinach can be served in many attractive ways: With vinegar, hard cooked eggs, cream sauce, with poached eggs and as a salad.

BOILED SPINACH. One half peck spinach. Remove roots and dried yellow leaves and wash in several fresh waters to remove the grit and sand. Sometimes if the leaves are very wrinkled, it would be well to pour boiling water over it with $\frac{1}{4}$ teaspoon soda. This will cause the folded parts to open and soften, and then wash in several cold waters. The sand will be removed more easily and the spinach will be crisp after rinsing in cold water.

Cook young tender spinach without adding water, about 20 minutes. Chop finely or put through a colander; re-heat with 2 tablespoons butter and season with salt and pepper. Garnish with 2 hard cooked eggs and toast points.

If old spinach is used, it will be a better green color and flavor if boiled uncovered until tender in one quart salted water (1 teaspoon salt to a quart of water). Drain thoroughly, chop well and season.

CREAMED SPINACH. Wash and pick over one half peck spinach. Cook in an uncovered vessel in a large quantity of boiling salt water to which has been added $\frac{1}{4}$ teaspoon soda. Drain well, chop finely and run through a sieve. Heat 2 tablespoons butter until bubbling in a sauce pan. Add 2 tablespoons flour and rub smooth in the butter. Add gradually 1 cup of cream or milk and when this has boiled about 5 minutes, add the spinach and reheat.

This may be served on toast and garnish with hard cooked eggs and toast points.

SPINACH FRENCH STYLE. Pick over and wash one peck spinach and cook about 20 minutes in boiling salted water. Drain and rub through a colander. Re-heat and add a sauce which has been made by heating 2 tablespoons butter, rubbing in 2 tablespoons flour and adding $\frac{1}{2}$ cup chicken stock; season with $\frac{1}{2}$ teaspoon sugar, $\frac{1}{2}$ teaspoon salt, $\frac{1}{4}$ teaspoon pepper and $\frac{1}{4}$ teaspoon grated nutmeg, $\frac{1}{4}$ teaspoon grated lemon rind.

SPINACH SOUP. One quart of stock, 2 cups boiling water, 2 quarts spinach, 2 cups milk, 4 tablespoons butter, 5 tablespoons flour, salt and pepper. Wash, pick over and cook spinach in boiling water 25 to 30 minutes, adding $\frac{1}{2}$ teaspoon sugar 1 teaspoon salt $\frac{1}{6}$ teaspoon soda. Drain, chop and run through a colander. Add spinach to the boiling stock and allow to boil up again. Then add the milk and seasoning with the pepper and salt.

The water in which a chicken is cooked makes a very good stock to use for spinach soup. A good stock may be made from 2 pounds knuckle of veal, 1 quart cold water 2 slices onion, $1\frac{1}{2}$ teaspoon salt, 6 peppercorns, 1 teaspoon fresh celery seed, 1 blade mace. After wiping meat with damp cloth remove from bone and cut into pieces. Put all into a kettle and heat slowly to the boiling point. Simmer about three hours, skimming frequently. By straining through a double thickness of cheese cloth, the stock will be clear.

SPINACH SALAD. One half peck spinach cooked the same as for creamed spinach. A very wholesome and pretty salad can be made of spinach. After it is well cooked, chop and press through a sieve, season with salt and pepper, 3 tablespoons melted butter, 1 teaspoon lemon juice, and pack tightly in small moulds so it will hold shape of mould when turned out. Chill and let stand in the moulds one hour before serving. Turn out on round pieces of cold boiled ham placed on lettuce leaves. Serve with cooked salad dressing or the following sauce: Yolk 1 egg, $\frac{1}{4}$ teaspoon mustard, $\frac{1}{3}$ teaspoon powdered sugar, $\frac{1}{4}$ teaspoon salt, spk. cayenne, 5 tablespoons olive oil, 2 teaspoons lemon juice or vinegar, $\frac{1}{2}$ tablespoon each olives, pickles and parsley. Mix dry ingredients and rub smooth. Add yolk of egg and thoroughly mix. Set the bowl containing mixture in pan of ice water and when quite chilled, add the oil, drop by drop, stirring constantly with a silver fork or spoon. As the mixture thickens, add a few drops of vinegar and continue stirring while adding the remainder of the oil and vinegar alternately until all is used. Add other ingredients and keep the sauce in a cold place until ready to serve.

CANNING SPINACH. Prepare the spinach by picking off all dead leaves and cutting off the roots. Cover 1 peck spinach for 2 minutes with scalding water in which you have dissolved 1 teaspoon soda to a gallon of water. Wash thoroughly through several cold waters; drain and boil rapidly in boiling water 4 to 6 minutes. Drain well and pack into sterilized jars or cans, cover with boiling salt water using 1 tablespoon salt to 1 quart water. Process in a water bath 1 hour at 212 degrees. Process by steam pressure 30 minutes 235 degrees 8 pounds pressure.

TO PREPARE CANNED SPINACH FOR THE TABLE. Remove the contents from the can just as soon as it is opened. Drain the liquor from the spinach. Chop finely and reheat in a sauce pan with 2 tablespoons butter, $\frac{1}{2}$ teaspoon salt and pepper. Garnish with hard cooked eggs, or serve it in any way fresh spinach may be served.

CAULIFLOWER.

CREAMED CAULIFLOWER. Pick off the outer leaves, cut off stalk and soak 15 to 20 minutes (head down) in cold water. Drain, cook, (head up) until tender in boiling salted water, using 1 teaspoon salt to each quart of water. When done, lift it gently out, place on a hot dish, (stem down) and pour over it a hot cream sauce, and serve hot with bits of lemon to garnish or with chili sauce, or the flowrets may be separated after the cooking; drop into the white sauce and reheat before serving.

CREAM SAUCE. 2 tablespoons butter, 2 tablespoons flour, 1 cup milk, $\frac{1}{4}$ teaspoon salt, 2 grains pepper. Melt the butter in sauce pan being careful it does not burn, add the flour and rub smooth. Add the milk, $\frac{1}{3}$ at a time stirring to mix well and allow it to boil after each addition of milk. Beat well.

BAKED CAULIFLOWER. (CAULIFLOWER AU GRATIN) Cook cauliflower in salted boiling water until tender. Drain, break into pieces. Cover bottom of baking dish with cauliflower, then place a layer of grated cheese, another layer of cauliflower and grated cheese, and pour 1 cup cream sauce over it. Sprinkle the top with breaded crumbs and brown in the oven.

CREAM OF CAULIFLOWER SOUP. 1 quart hot soup stock, 1 cauliflower, 4 tablespoons butter, 1 slice onion, $\frac{1}{2}$ teaspoon crushed celery seed, $\frac{1}{2}$ bay leaf, 4 tablespoons flour, 2 cups milk, salt and pepper. Soak cauliflower in cold water, stem up, for $\frac{1}{2}$ hour. Cook in boiling water until tender. Pick out about $\frac{1}{3}$ of the flowrets and rub the remainder of the cauliflower through a sieve. Cook the onion, celery seed, and bay leaf in the butter 5 minutes; then add flour and stir until well blended. Stir in the hot stock and boil 5 minutes. Add strained cauliflower and hot milk; season with salt and pepper. Strain, add flowrets and reheat.

BRINING CAULIFLOWER. The surplus crop of cauliflower can be brined and used in mixed pickles later in the year when you have other vegetables.

The "rice" head cauliflower are heavier than the smoother heads and are not so fine for the market but they are very good for pickling. Plain tight barrels or kegs may be used. "Second hand" charred barrels are very satisfactory. Be sure barrels are clean before filling with the cauliflower.

All outer leaves should be removed with the stump and heads put in whole if possible. Fill barrels full with cauliflower heads and fill about two-thirds full with brine which tests 40 degrees with a salometer.

Head the barrels and bore a small hole ($\frac{1}{2}$ " to $\frac{3}{4}$ ") in the top and the barrel is then filled with brine through this hole. A little brine has to be added from time to time to take care of any leakage. Turn barrel at end of each week for six weeks. To do this, bung hole up tightly and turn barrels upside down so the salt which has settled at bottom will be equally distributed again. Watch for leakage and be sure to keep cauliflower well covered with brine.

After 2 months the cauliflower should be repacked. Skim the brine using a skimming ladle. Dip out the cauliflower and repack fairly tightly in a clean barrel which has been scalded. Cover with brine testing 40 degrees with salometer. Bung up, fill top with water to take care of leakage and allow to stand about 6 months or until ready to use.

If an instrument cannot be had for testing the brine, use 1 pound salt to each gallon water, 1 part salt to 8 parts water (1 pt. salt 8 pt. water).

COOKED MAYONNAISE DRESSING.

yolks 2 eggs	1 teaspoon mustard
1 tablespoon flour	1 cup milk
2 tablespoons melted butter	1 tablespoon sugar
	$\frac{1}{2}$ cup hot vinegar

Mix dry ingredients, mashing lumps smooth with back of spoon. Slightly heat the yolks and mix in the dry ingredients, add 2 tablespoons melted butter, beating all the while, add 1 cup cold milk, stir well and cook over a pan of hot water very slowly until the mixture coats a spoon. Now add the $\frac{1}{2}$ cup hot vinegar and take from the fire. If the mixture should curdle, add 2 tablespoons cold water and set pan into cold water and beat until it becomes smooth.

FRENCH SALAD DRESSING.

$\frac{1}{2}$ teaspoon salt	$\frac{1}{2}$ teaspoon pepper
2 tablespoons vinegar or lemon juice	4 tablespoons olive oil

Mix all ingredients and shake well in a bottle until well blended. French dressing is more easily prepared and widely used than any other dressing.

LETTUCE.

There are many ways in which lettuce may be served; for different salads, use the tender leaves to make a nest for the salad mixture; for garnishing cold meat dishes and for sandwiches, it is very delicious with a little cooked salad dressing with or without the addition of pecan nuts.

LETTUCE SALAD. Pick over and wash the lettuce without breaking. Drain well and keep in a cool place until just before serving, then dry between two tea towels. Arrange the leaves in the salad dish, the larger ones around the edge and the smaller ones in the center. Then pour over the French dressing and garnish with a "radish flower".

In the spring nasturtium blossoms make a pretty garnish.

LETTUCE AND BEAN SALAD. An attractive salad may be made by using the combination of lettuce from the winter garden and a can or jar of whole beans. Canned beans should be removed immediately from the can when opened, drained, and allowed to stand 15 minutes before using. Make a nest of the lettuce leaves or shread them, then pile in log cabin fashion about 6 or 8 beans on the lettuce and fill center with chopped nuts and dressing. This makes a very pretty as well as a wholesome salad. Garnish with a radish.

RADISH FLOWERS. A pretty way to serve radishes is to pare the skin back about half way in narrow strips, being careful not to break them off and allow to soak in cold water about an hour before serving. These strips curl back from the radish resembling petals of a flower and look very pretty served in a dish together or used for a garnish.

CABBAGE.

CABBAGE SALAD. 3 cups chopped cabbage, 2 large sweet peppers, cut in strips, $\frac{1}{2}$ cup sugar, $\frac{1}{2}$ cup vinegar, 1 teaspoon salt.

Soften $\frac{1}{2}$ box gelatin in $\frac{1}{2}$ cup cold water. Then fill cup with boiling water. Mix all ingredients and mould in a shallow pan which has first been wet with cold water and not dried. This will make it easy to slip mixture out when it is set.

Make several hours before you wish to serve it and keep in a cold place. Cut in squares and serve on lettuce leaves with cooked Mayonnaise dressing.

BOILED CABBAGE. Remove the outer leaves from the cabbage, cut into halves if small head, into quarters if a large head, and remove the tough stalk. Allow to soak in cold water about 15 minutes before dropping into a vessel of boiling salted water to which you have added $\frac{1}{3}$ teaspoon soda. Cabbage, in fact, all strong flavored vegetables such as turnips, onions and cauliflower, should be cooked in a large amount of water and be cooked uncovered. This will prevent the disagreeable odor during cooking. Cook about 35 minutes or until tender, the time varying with the size of the cabbage. Remove from the water carefully, drain, season with salt, pepper, butter or a white sauce may be poured over the cabbage. Serve hot on a hot dish. Use same white sauce as given with creamed cauliflower.

COLESLAW. Select a hard, heavy, white head for coleslaw and remove outer leaves. Cut into quarters and soak 15 minutes in cold water. Drain well and shave thinly into strips with a sharp knife. Dry by shaking it in a clean towel and mix with cooked salad dressing.

STUFFED BAKED CABBAGE. 9 sausages, 1 onion, 1 inch red pepper pod, 1 square inch ham or a slice of bacon, 1 tomato, 1 head cabbage, salt and pepper. Remove outer leaves of cabbage, soak in cold water $\frac{1}{2}$ hour. Scald the head and the large leaves in boiling salt water with $\frac{1}{3}$ teaspoon soda for about 15 minutes. Make a stuffing of the minced ham or bacon, the sausage, onion, and tomato. Mix well and season. Lift cabbage from water, drain well and open carefully to the heart. Put in 2 or 3 tablespoons dressing fold 2 or 3 leaves over this then put in more dressing and so on until cabbage is well stuffed. Place the outer leaves around the stuffed head, press together and tie. Put into a buttered baking dish; pour over 1 C. white sauce seasoned with red pepper and a little salt. Sprinkle top with buttered crumbs and bake until tender (about 15 to 25 minutes). Remove outer leaves, serve on a hot dish with the sauce.

SAUER KRAUT OR "CROUT". Use 1 to 3 quarts salt to 20 gallons shreaded slaw. Remove outside leaves and hard core of cabbage. Shread finely. Line the keg with the larger leaves on the bottom and sides as you fill it. Put in a 3 inch layer of shreaded cabbage and sprinkle with 4 or 5 tablespoons salt. Continue to repeat this process, lining with the large leaves. Pound it all down well until the cask is full and covered with the brine. Cover with the large leaves and a board cover to fit inside the cask. Weight this cover down with heavy weight so it will keep the cover level. It is necessary that all the cabbage is covered with brine at all times. Keep in a cool, dry cellar 3 weeks to a month. Remove the scum and see that it is well covered with juice. When the weather is warm, the kraut will cure in 16 to 18 days, when it is ready for use or for canning.

It may be packed in #3 cans and covered with boiling water. Cap, exhaust 5 minutes, tip and process 30 minutes under 10 lb. steam pressure (240 degrees).

Sauer kraut is usually made in fall for winter use. It may be eaten raw, fried, boiled with pork with onions added, or with weinerwurst sausage and browned in oven or cooked with spareribs.

SINCERELY YOURS,

OLA POWELL,

ASSISTANT IN GIRLS' DEMONSTRATION WORK.

United States Department of Agriculture,
States Relations Service.
Washington, D. C.

OFFICE OF EXTENSION WORK IN THE SOUTH.
FARMERS' COOPERATIVE DEMONSTRATION WORK.

No. 784

JULY 3, 1915.

TO CANNING CLUB GIRLS IN THE SOUTH:

These recipes have been prepared for uniform 4-H Brand pickles and ketchup. All measurements are level and should be carefully made. Abbreviations used are: tbsp = tablespoonful; tsp = teaspoonful; c = cup. Brine in which vegetables stand for brief time is about 45% (1 c. salt to 1 gal. water). If vegetables are to be brined for several months, it is necessary to use a salt per cent scale (see letter 853) and to ask us for further instructions.

TOMATO KETCHUP. Select red ripe tomatoes. The extra juice, small and broken fruit which will not do for canning, may be used, if they are sound and red. Any green or yellowish parts of fruit will make a ketchup inferior in flavor and color, and not good for market. Use whole spices tied loosely in a bag while cooking and remove before bottling to prevent darkening the product caused by ground spices. This does not apply to red pepper, which helps to give a bright red color. The pulp of sweet Spanish pepper or the ground Hungarian paprika may also be used to give color and flavor. Remove seeds from sweet red pepper, chop and add 1 c. of this pepper and 2 medium size onions to 1 gal. tomatoes before cooking.

Cook the tomatoes thoroughly, put through a colander or sieve, saving all pulp, and measure. For every gallon of pulp use the following:

2 tbsp. salt	1 level tbsp. each whole of allspice,
4 " sugar	cloves, cinnamon and pepper
1 " mustard (Powdered)	2 small red peppers sliced and seed
1 pt. good vinegar	removed.

After putting tomatoes through colander add ground spices and spice bag, and cook for 1½ hours, or until nearly thick enough, then add vinegar and cook until thick. Rapid cooking (being careful not to scorch the ketchup) will give a better color than slow cooking. The finished product should be a fine bright red.

Pour the ketchup at once into hot sterilized bottles. If any quantity is made for sale, set the hot bottles at once into a vessel of hot water, having a false bottom in it to prevent breakage, put the cork stoppers in loosely and process at boiling point for 30 minutes. Drive the corks in tightly and when cool dip mouth of bottle into melted paraffin, or cover stopper with sealing wax.

MUSTARD PICKLE.

VEGETABLES.

DRESSING.

1 pt. whole small cucumbers	:	1 qt. vinegar
1 pt. sliced cucumbers	:	4 tbsp. flour
1 pt. small whole onions	:	1 c. sugar
1 c. beans	:	3 tbsp. powdered mustard
3 green sweet peppers	:	½ tbsp. turmeric
3 red " "	:	1 tsp. celery seed
1 pt. green fig tomatoes, or	:	
1 pt. cauliflower.	:	

Cut all vegetables before measuring: tomatoes into halves, cucumbers into slices, string beans into 1½ in. length, diagonally or on the bias, and chop peppers. All vegetables should be tender, and the whole cucumbers not longer than 2½ inches.

Put all vegetables into brine over night, then freshen in clear water for 2 hrs. Let these vegetables stand in liquor of ½ vinegar and ½ water for 15 minutes, then season same liquor.

To make mustard dressing, rub all the dry ingredients together until smooth, then add the hot vinegar slowly, stirring to make smooth paste. Cook over pan of water, stirring carefully, until the sauce thickens. Then drain the vegetables thoroughly and pour the mustard dressing over them while hot. Mix well and pack in sterilized jars. Process 10 oz. jars for 20 minutes at 180° F. (Simmering).

SPICED CUCUMBER SALAD.

VEGETABLES.		SPICED VINEGAR.	
5 lbs. sliced cucumbers	:	1 qt. vinegar	
(about 2 dozen)	:	$\frac{1}{2}$ c. sugar	
$\frac{1}{2}$ c. chopped onion	:	1 tbsp. each salt, powdered	
2 c. " sweet red pepper	:	ginger and mustard seed	
1 c. " green pepper	:	2 tsp. celery seed (crushed)	
	:	1 tbsp. each of whole pepper,	
		cloves, cinnamon & allspice.	

Mix the cucumber and onion and sprinkle alternate layers with salt, using $\frac{3}{4}$ c. for whole. Let stand over night. Put peppers in brine over night. Next morning drain vegetables and freshen for 1 to 2 hrs. in clear water.

Put all whole spices in cheesecloth bag except the celery seed and mustard seed, which are put in loose. Add spices to the vinegar and boil for 5 minutes. Drain the vegetables well and pour the hot spiced vinegar over them. Let stand 24 hours. Pack, distributing the pepper well and flattening some of the cucumber slices against the face of each jar. Fill jars with same vinegar and paddle well to remove all bubbles. Garnish with strips of red pepper or pieces of spice. Process 12 oz. or pint jar for 15 minutes at 180° F.

PICKLED ONIONS.

Select small white onions and sort into two sizes, $\frac{1}{2}$ in. diameter in one and $\frac{3}{4}$ in. in other. Peel, cover with fresh water and let stand for 2 days, changing the water on second day. Wash well and put in brine for 4 days, changing brine at end of second day. Take out of brine and put in boiling water. Let stand for ten minutes, then put in cold water for 2 hours. Drain, and pack in jars, putting in a few small red peppers, and garnishing with sprigs of mace. Fill jars to overflowing with spiced vinegar, made previously and allowed to stand for a few days with spice bags left in it. Process as for pickles.

SPICED VINEGAR.

$\frac{1}{2}$ gal. vinegar	$1\frac{1}{2}$ tbsp. mustard seed
$1\frac{1}{2}$ tbsp. celery seed	1 " salt
$\frac{1}{2}$ c. grated horseradish	1 " cinnamon
1 c. sugar.	

Cloves, nutmeg, and grated onion may be added if desired.

GREEN TOMATO PICKLE.

1 gal. green tomatoes	1 tbsp. whole black pepper
$\frac{1}{2}$ doz. large onions	1 " " cloves
3 c. brown sugar	1 " " allspice
$\frac{1}{2}$ lemon	1 " celery seed (crushed)
3 pods of red pepper	1 " mustard seed.
3 c. vinegar	1 " ground mustard.

Slice the tomatoes and onions thin. Sprinkle over them $\frac{1}{2}$ c. salt and let stand over night in a crock or enamel vessel. Tie the pepper, cloves, allspice and celery seed in a cheesecloth bag. Slice the lemon and chop 2 pepper pods very fine. Drain the tomato and onion well. Add all seasoning except one pepper pod to the vinegar, then add the tomato and onion. Cook for $\frac{1}{2}$ hour, stirring gently at intervals to prevent burning. Remove spice bag to prevent darkening product. Pack in 10 oz. jar and garnish with slender strips of the red pepper, placing them vertically on the opposite sides of each jar. Process for 15 minutes.

SINCERELY YOURS,

MARY E. CRESWELL,

OLA POWELL,

ASSISTANTS IN HOME DEMONSTRATION WORK.

Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH.
FARMERS' COOPERATIVE DEMONSTRATION WORK.
Washington, D. C.

CANNING CLUB CAP AND APRON.

Sewing is an important part of the program for each of the four year's work planned for canning club members. The first sewing done by Club members should consist of cup towels and holders for use in public demonstrations. These articles should be made by the first year girls before the cap and apron are undertaken. When canning in groups it will be an advantage for each girl to have her initial very neatly outlined in one corner of her towels. The holders should have washable covers, which can be easily removed and kept clean. These covers may be buttoned on or have the lap tied with narrow tape.

THE CAP.

MATERIAL. Let the brim be white, made of plain lawn of medium weight or better still of light weight linen. Make the crown of thinner material, like dotted Swiss. It will take a piece 18 in. long and 16 in. wide for the crown and two pieces 10 in. long and 22 in. wide for the brim. The brim is rolled back half its width when finished and, in order to hold its shape when starched, is made double.

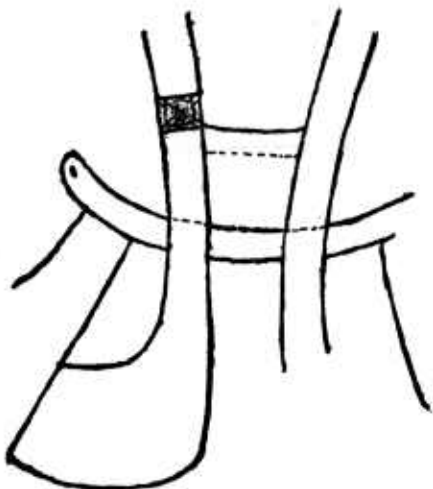


CUTTING. Cut the brim like the pattern given, laying the front end of pattern on fold of goods so that the only seam is at the back. Two pieces alike are needed for each brim. Cut the crown almost circular, 16 in. in diameter from left to right and 18 in. in diameter from back to front.

MAKING. Place the two pieces of the brim together, wrong side out, and baste around the outer edge. Then stitch $\frac{1}{8}$ inch from this edge. Now, turn the brim right side out, creasing the edge well. Stitch again $\frac{1}{8}$ inch from the outside edge. Gather the crown in fourths. Place outside edge of crown against inside edge of brim. Baste these two edges together, allowing a few more gathers at front and back than at sides. Now, turn the folded outside edge of brim over these two raw edges and baste carefully. Stitch $\frac{1}{8}$ inch from edge so as to hold securely. Place the emblem on the left point.

THE APRON.

MATERIAL. Light weight white percale or any other medium weight white material will do. About three yards of 36 in. material will be needed.



CUTTING. Cut the apron by a gored pattern, having front panel twice as wide as each side. It should give protection to the entire dress. Cut the belt and shoulder straps double and to be 2 in. wide when finished. Cut a bib $7\frac{1}{2}$ in. long, 6 in. wide at top, and 4 in. wide at belt. Cut pockets like the pattern given.

MAKING. Face the curved opening of each pocket and stitch twice, on edge and $\frac{1}{8}$ in. within. Baste the pockets on the front gore so that the short side edge will be sewed in with side seam, and the top edge

will reach the top of the belt. Fold under the opposite edge of each pocket $\frac{1}{2}$ in. and stitch it onto the front gore, using two rows of stitching $\frac{1}{2}$ inch apart. Sew the shoulder straps to the top of the pockets, leaving the outer edges of the two loose from the belt, giving the effect of the pocket and strap being cut in one piece. Let the belt pass under this strap. Fasten the belt with button and button hole. Let the strap cross in the back and fasten to belt in the same manner, having the button hole in the belt and button on strap so as to change strap length when necessary. French seams should be used on the skirt. The hem at bottom should be 2 in. wide. Place the emblem on the left strap, the lower line at top of bib.

Aprons for the younger girls may have a gathered skirt. For them the cap circle and brim may be cut smaller. The inside edge of brim should be the size of the head.

THE EMBLEMS.

MATERIAL. If the cap brim and apron are made of linen, embroider the design directly on them. If not, select a coarse thread linen, cutting the piece for cap emblem $3\frac{1}{2}$ in. square and the piece for apron emblem 3 in. square, to be applied to the brim and shoulder strap when finished. Use a twisted mercerized thread in two shades of blue and one shade of red. About five yards of darker blue, four yards of lighter blue and one yard of red are enough to embroider one set of emblems.

Since the cap and apron are worn in public demonstrations and meetings, they should be as attractive as possible and uniform throughout the county. For this reason white material is desirable. To embroider the emblem on the cap brim and apron strap will enhance their value and give opportunity for teaching some simple embroidery.



CAP EMBLEM. Use outline stitch for making the square, circles and letters, using a medium shade of dull blue; make the periods in French knots. After the letters are outlined, fill in the space between the circles with a seed stitch in lighter blue. This is simply a very small basting stitch. To make it effectively, let the needle pass over two threads, then under two, repeating. These stitches may cross the design, being horizontal or follow the outlines around the circle. This will make the letters stand out more plainly. Outline the tomato in red. Fill in the solid part with the same seed stitch in red, letting the stitches take the same direction as those within the circle. The design made in this way will be flat,

thus being very pretty and easily laundered. If desired, the tomato stem may be worked in green.

APRON DESIGN. Outline the square, four H's, circle and clover leaf in the way described in cap design, using the darker shade of blue. Fill in the inside clover with the seed stitch in the lighter blue.



PATTERNS. Information in regard to the apron pattern and transfer patterns for emblems can be secured from your county agent.

SINCERELY YOURS,

MARY E. CRESWELL,
OLA POWELL,

ASSISTANTS IN HOME DEMONSTRATION WORK.

United States Department of Agriculture,
Bureau of Plant Industry,
Farmers' Cooperative Demonstration Work,
Washington, D. C.

No. 780.

OBM-ES
March 8. 1915.

TO ALL CANNING CLUB AGENTS:

The following instructions for growing currants and gooseberries have been prepared by Mr. Geo. M. Darrow, of the Horticultural and Pomological Investigations of this Bureau.

In many counties in certain sections of the South work of this kind should be taken up by the girls who have had two or three years' experience in the clubs. Circular No. 779, of this Office, gives suggestions in regard to having the girls begin certain perennial vegetables and fruits in their gardens after they have grown such crops as tomatoes and beans for one or more years. Doubtless many of our leading agents and best trained girls will be able to take up the currants and gooseberries as well as other small fruits in sections well adapted to them.

CURRENT AND GOOSEBERRY CULTURE.

"The gooseberry and currant should be grown only by canning club members in Maryland, West Virginia, Northern Kentucky and the mountain regions of the other states. Both of these fruits are natives of the cool northern part of the United States and will not do well in the warmer parts. They both grow in the form of a bush and their culture is very similar. They are used for similar purposes, for making jelly, jam and other preserves. The currant, however, seems to be liked best by the American people.

SELECTION AND PREPARATION OF SOIL.

Select the one-tenth of an acre of ground for growing your currants and gooseberries in the coolest place possible. Choose a northern or northeastern slope for your plants if you can. The soil should be well drained and fertile. One of the heavier types such as a silt or clay soil should be preferred to a lighter type.

Plow the soil just as early in the spring as possible and apply two wagon loads of stable manure. Harrow this in. If more convenient the manure may be applied before plowing.

The Downing gooseberry is the best variety to use. There are other good new varieties such as the Carrie, Josslyn, Oregon and Poorman, but these have not been sufficiently tested in the South to be sure that it will pay to grow them.

Only the red currants should be grown in any quantity. The white varieties are not generally very popular, though a few mixed with the red kinds are very attractive. The white varieties are not as acid as the red ones and are not liked as well for preserving. You may take your choice of several varieties of red currants, all of which are very good. The Perfection, London (London Market) Red Cross, Wilder and Albert (Prince Albert) are all desirable kinds. The White Grape is the best white variety.

SELECTION OF PLANTS.

Either one year old or two year old plants may be ordered and will prove satisfactory. As the currant and gooseberry start growing very early in the spring, the plants should be ordered during the winter with the condition that only entirely dormant plants be sent. The plants should be promptly secured from the station after their arrival. They should be set at once, or, if this is not possible, a trench should be dug in the ground, the plants separated from each other, and all but their tops covered.

PLANTING.

The plants may be set either in late fall or in early spring. They should be set 4 feet apart in rows 6 feet apart. You will need 180 plants to set the one-tenth of an acre. When setting the plants out cut off all broken roots. If the tops are very long they should be cut back to 12 inches in length. The plants should be set slightly deeper than they stood in the nursery. The soil should be well firmed about the roots.

FERTILIZERS.

Stable manure is the best fertilizer to use on your field. If two loads are applied before the plants are set no more will be needed for the first year. Stable manure is a good thing to apply just before winter comes. Hen droppings are frequently used for gooseberries. Some of you may need more fertilizer than I have indicated, some may need less. You must watch your plants grow and try putting on more or less fertilizer on parts of your field to find out just what you need.

PRUNING.

Six or eight main branches are needed to form a symmetrical top which will bear the most fruit. During the first two years pruning will consist simply in cutting out the weakest shoots. Later, pruning will consist in cutting out the shoots which are three years old, and allowing a strong young shoot to take the place of each one cut out. Any branches lopping on the ground should be removed.

DISEASES AND INSECTS.

Generally the only pest in the plantation will be the currant worm. Dusting the leaves with hellebore, at the rate of one pound of hellebore to 5 pounds of flour or air-slacked lime will control this worm.

YIELDS.

During the first year no fruit will be secured. During the second year very little fruit will be borne. If the bushes have grown well by the third year you should average over one pint per plant, and some should get a quart per plant. By the fourth year the plants will be in full bearing and you should secure 2 or 6 quarts per bush.

PROPAGATION.

New plants of currants and gooseberries are made by cutting off shoots of the new growth late in the fall after the leaves have dropped. These cuttings are buried in the ground until spring and then set out in a row about six inches apart. Only two buds should be left above ground. By fall plants for setting will have grown."

The agents are requested to order from time to time as many copies of this circular as they need for girls who are to take up the work along these lines.

O. B. MARTIN,
ASSISTANT IN CHARGE OF DEMONSTRATION CLUB WORK.

OLA POWELL,
ASSISTANT IN HOME DEMONSTRATION WORK.

Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
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STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH,
FARMERS' COOPERATIVE DEMONSTRATION WORK,
Washington, D. C.

HOW TO BUILD AND USE A FIRELESS COOKER.

PRINCIPLE. The principle of the fireless cooker is to retain the heat obtained by first boiling the food for a few minutes. It is then placed in the cooker which does not allow the heat to escape. The food must be heated in the same vessel in the cooker. This vessel must have tight cover and be moved from fire to cooker as quickly as possible. Otherwise, heat will be lost. Hot soapstones are sometimes placed in the cooker with the food when higher temperature is needed or longer cooking desired. These may be purchased from a hardware dealer at 50¢ each.

ADVANTAGES. 1. Time saving; while food is cooking, the housekeeper may be occupied with other duties without fear of its burning.

2. Better foods; many foods thus cooked for a longer time at a low temperature have finer flavor and are more wholesome than if cooked on a stove at higher temperature.

3. Comfort; saves working in hot kitchen, keeping up fires, watching food.

4. Fuel saving; fire kept up just long enough to make food boiling hot before putting in cooker. In summer, the use of a fireless cooker with a kerosene stove will result in both comfort and economy.

BUILDING THE COOKER. Select a tightly built wooden box, an old trunk, barrel, large lard tub, or tin lard can for the outside container. This must be large enough to allow at least four inches of packing all around the nest. A box long enough to contain two compartments may be secured. If this is done there should be at least 6 inches of packing between the two nests, and two cushions to cover each nest separately so that one vessel may be removed without disturbing the other.

THE NEST. The nest, to contain the vessel of hot food, must be considered next. If no hot stone is to be used, this nest may be made of strong paste board cylindrical in shape and as snug as possible to allow cooking vessel to be moved in and out. If too large, the air space will cool the food. The cardboard forming this cylindrical nest should be lapped and fastened tightly. If a hot stone is to be used, a metal nest must be used. A tin bucket will do or better still have a tinner make a galvanized iron one deep enough to contain a soapstone and the cooker vessel. This metal vessel must be wrapped with asbestos to prevent the hot stone from scorching or burning the packing.

PACKING. For packing between the nest and outer container some material which heat will not pass through quickly must be used. First, line the box or other container with layers of paper to keep out cold air. Lint cotton, wool, shredded newspaper, Spanish moss and excelsior are good for packing. The packing should first be placed in the outside container to a depth of four inches, then place the cardboard or asbestos for the bottom of the nest. Next place the cardboard cylinder or the asbestos covered can and hold steady while pressing the packing tightly around it,

leaving no air spaces. When this has reached the top of the nest, cut a piece of cardboard to fit the space, cutting out a circle to open the nest. This cardboard cover should be fastened securely to the nest by pasted strips of cloth or heavy paper. It is well to make a paper cover to keep the cardboard clean and hide the pasted strips on top. The space between the top of nest and the lid of the outside container must be filled with a cushion or pad. Make this the exact size of the space and stuff with the packing material. It should be at least four inches thick and should fit against the top tightly enough to cause pressure when the lid is closed. If a box is used, the lid should be on hinges with hook to fasten it down. The lid of barrel or lard tub may be fastened by means of screw hooks and eyes at intervals around the top. If a wooden container is used, it will be more sightly if stained or painted a dull, dark brown or green. The cooker will be complete when castors have been put on the bottom to make it easily moved.

FOOD VESSEL. For this any utensil which has a tight cover and which will fit the nest may be used. There should be no air space left to cause loss of heat. A vessel having straight sides and having the same depth as diameter is best. A special enamel or aluminum fireless cooker vessel can be purchased for 50¢ to \$1.50 depending upon size and material. Aluminum is the best because it will retain heat for a longer time.

USING THE HOME-MADE COOKER.

Efficient cooking will depend upon retention of heat. A small quantity of food will not hold as much heat as a larger one and will therefore continue cooking for a shorter time. The more nearly full the vessel is of food, the better will the heat be retained. In heating the soapstone, be careful not to let them become red hot because of danger of cracking.

NOTE: All measurements used in these recipes are level. The cup used holds one-half pint. The abbreviations are: tsp. - teaspoonful, tbsp. - tablespoonful, c. - cup.

CREOLE CHICKEN.

1 medium sized chicken	1 Bay leaf
6 Tomatoes or 1 #2 can tomatoes	1 tbsp. chopped parsley
3 Sweet red peppers cut in small cubes)	2 tsp. salt
3 Sweet green " " " " ")	1 onion (size of egg)
(or 1 #2 can of peppers)	2 tbsp. butter or bacon drippings
½ pound ham or 2 or 3 slices bacon chopped finely.	

Cut chicken as for stew: sear by dropping it into 1 pint boiling water; then let simmer gently for ½ hour.

Cook the chopped onion in the butter or meat drippings until light yellow. Simmer tomatoes for 15 minutes with the bay leaf, strain, and pour over the onions. Now add the minced ham and parsley and cook for 15 minutes longer. To this mixture add the chopped peppers and the chicken stock and bring to a boil. Place the chicken in the fireless cooker vessel, pour over it this mixture of vegetables and let boil 5 minutes. Put at once into the fireless cooker. With the hot soapstone, let the chicken stay in the cooker for 2 hours; without hot stone, for 3 hours.

A ham bone may be substituted for the ham or bacon. If this is done, boil it for $\frac{1}{2}$ hour in enough water to cover. Then add one cup of the ham broth to the tomato before cooking it with the bay leaf. This recipe gives a good way to use chicken too old to fry or broil. A similar dish can be made by using a quart of Canning Club soup mixture. When necessary, thicken the broth with a little browned flour before putting the chicken in the cooker.

CEREALS.

HOMINY GRITS. 5 c. water, 2 tsp. salt, 1 c. hominy grits. Pick over and wash hominy grits. Have the salted water boiling and add the hominy slowly so as not to stop the boiling. Continue to boil rapidly for ten minutes over the fire, then place the vessel into the cooker as quickly as possible and allow to remain (over night) for about 12 hours. The vessel of hominy may be placed in another vessel of boiling water before being placed in the cooker.

SAMP (COARSE HOMINY). $\frac{1}{2}$ c. samp soaked in 1 c. cold water 6 hours. Add $1\frac{1}{2}$ tsp. salt and 3 c. boiling water. Boil rapidly 45 minutes. Put in cooker 8 to 12 hours.

OAT MEAL. 3 c. water, 1 tsp. salt, 1 c. oatmeal. Carefully look over the oat meal and remove any husks or foreign substance. Add gradually to the boiling salted water and boil rapidly for 10 minutes stirring constantly. Now it may be put into the cooker. After 2 or 3 hours it is soft but a better flavor will be developed by longer cooking. It may remain in the cooker over night in the same manner the hominy grits are cooked (about 12 hours). Next morning it may have to be reheated: to do this, set the cooker pan in a pan of water over the fire. When the water boils up well, the oat meal may be served.

PLAIN RICE. 1 c. rice, 3 c. water, $1\frac{1}{2}$ tsp. salt. Look over and wash the rice through several waters, until cloudiness is removed. Bring the salted water to a boil. $\frac{1}{2}$ tsp. lard may be added. Then add rice gradually into the boiling water in the cooker vessel so as not to stop the boiling. The grains should be kept moving in the boiling water and allow to boil 5 minutes before putting it into the cooker for 45 minutes or an hour.

There is a considerable difference in rice. Old rice absorbs more water than new rice and the time for cooking it will vary. An hour will be sufficient usually for this small amount. Rice is injured by overcooking. When rice is tender, drain in colander and place in warm oven for about 5 minutes. Serve at once. Sometimes it is well after draining rice in colander to pour cold water over it. This will wash away the starchy substance between the grains, and keep them from adhering or sticking together. Then place the colander in a hot oven to heat and dry out the rice. If desired the lard may be omitted. It lends a brilliancy to the rice grains when cooked.

RICE IN PILAF. (An Oriental Mixture.) 2 c. stock, 1 c. rice, 2 tbsp. butter, 1 tsp. sugar, 2 slices onion, 6 ripe tomatoes or 1 c. canned tomato juice, 1 tsp. salt, $\frac{1}{8}$ tsp. pepper, 1 tbsp. chopped green sweet pepper may be added.

Look over and wash the rice. Chop the onion very finely and fry in 1 tbsp. of the butter until yellow. Add to it the boiling juice of the tomatoes, and the

boiling broth and allow all to boil before adding the rice gradually so as not to stop the boiling. Boil mixture about 5 minutes and place in cooker 1 hour. When ready to serve, add 1 tbsp. butter. Stir with a fork to mix evenly. " Pilar is injured by overcooking.

SOUPS.

VEGETABLE SOUP. (Made without stock) $\frac{1}{2}$ c. carrots, $\frac{1}{2}$ c. turnips, 1 c. potatoes, $\frac{1}{2}$ c. onions, $\frac{1}{2}$ c. cabbage, 3 c. tomato juice or 1 #3 can tomatoes, 1 tbsp. flour, 2 tsp. salt, 1 tbsp. celery seed (crushed), 1 qt. water, 4 tbsp. butter, $\frac{1}{2}$ tbsp. parsley, $\frac{1}{4}$ tsp. pepper.

Cut all vegetables (except potatoes and onions and parsley) into small pieces. Cook them for 10 minutes in 3 tbsp. butter. Add potatoes and cook 3 minutes longer. Mix all ingredients (except parsley) in the cooker utensil and boil 5 minutes. Mix 1 tbsp. butter and 1 tbsp. flour; add enough of the liquor to make it smooth and pour it into the mixture. Cook 5 minutes more and place into the cooker for 4 to 6 hours.

CREOLE SOUP. (Made with stock) Stock: 2 lb. shin beef (meat and bone), $1\frac{1}{2}$ qt. water. Cut the meat from the bone into small pieces. Crack the bone and soak 1 hour in cold water. Bring to a boil slowly and when boiling place in cooker for 5 to 7 hours. When cooked, strain and set away to cool. The cake of fat which forms on top when stock is cold seals the stock and keeps out air and germs and should not be removed until soup is to be made. Then fat is removed and stock heated and any seasonings or additions desired are put in.

To 1 qt. of this stock or 1 qt. water in which chicken has been cooked, add 1 qt. of canned soup mixture and 2 tbsp. rice or barley, bring to a boil and cook in cooker 2 to 3 hours. This will make a delightful soup.

MEAT AND VEGETABLE COMBINATIONS. With the less tender cuts of beef and mutton which require long, slow cooking, delicious dishes may be prepared by adding vegetables and cooking in the fireless.

Cut the meat in cubes, dredge with flour and brown it in meat drippings or lard and butter. Then brown the onions in the same fat. For every 3 or 4 cups of meat, use one of the following vegetable combinations or 1 qt. of Canning Club soup mixture. Put into the fireless cooker vessel and add 1 cup boiling water with the first combination or two cups water with the second one. Boil for 5 minutes and put in cooker for 3 or 4 hours.

First:	2 c. okra	Second:	2 c. potatoes
	2 c. tomatoes		1 c. turnips
	2 onions		1 c. carrots
	$1\frac{1}{2}$ tsp. salt		2 onions
	$\frac{1}{8}$ tsp. pepper		$\frac{1}{2}$ c. celery or 1 tbsp. celery seed crushed

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Washington, D. C.

INSECT PESTS AND DISEASES OF THE TOMATO.

TO CANNING CLUB MEMBERS:

You have already received letters 543 and 591 in which you were told how to select and prepare your tenth acre, how to make hot beds, cold frames and seed boxes, and how to transplant, fertilize, and cultivate your tomatoes.

You may, during the season, have trouble with tomato diseases. At the same time that you try to prevent disease, it will be necessary to look out for insect pests which may do great harm. Then, too, you can fight insect pests and tomato diseases at the same time. You must understand that you can much more easily and cheaply take steps to keep your plants healthy than you can cure them after they become diseased. In fact, if the soil in which you plant your vegetables is infected with some of these diseases, you cannot hope to have healthy plants. It is too late to apply remedies after you see the trouble. You have already been told not to use soil for hot beds or cold frames in which diseased tomatoes grew last year.

INSECT PESTS.

The first insect you may have trouble with will probably be one of the various **CUT WORMS** which will cut down plants as soon as set out. A good remedy is poisoned bait placed so as to kill these worms before transplanting. Have nothing green growing on the plat for about two weeks before transplanting. Then discard collard, or cabbage leaves, bunches of clover or weeds into a solution of Paris green made by mixing one tablespoonful of Paris green in a bucket of water. Scatter these over the plat in the evening for two or three days before transplanting. Remember that Paris green is a poison and must be handled carefully. Another poison which can be used as a bait after the plants are set out is a mash made by mixing one peck bran and two cups cheap molasses with one ounce (two tablespoonfuls) of Paris green and enough water to moisten the mixture. Cotton seed meal may be used instead of bran, taking one quart of meal to one tablespoonful of Paris green. This is placed in small baits near the plants and may be kept moist under a bit of earth to protect it from the sun. Do not allow chickens or other animals to eat this poison mash. Another way to protect plants from cut worms, which you may have tried, is to wrap each plant when transplanting with a bit of paper which extends about one inch above and one inch below the surface of the ground.

Another insect which may attack your plants in the cold frame or soon after transplanting, is the **FLEA-BEETLE**, a tiny black jumping beetle which feeds upon the tissue of the leaf. Bordeaux mixture, which we advised for spraying to prevent disease, will also have some injurious effect upon the flea-beetle, but to

dispose of it and other injurious biting insects, it will be safest to add to the Bordeaux mixture either Paris green or arsenate of lead. For each 10 gallons of Bordeaux, add 2 ounces of Paris green or 10 ounces of arsenate of lead. Keep the mixture well stirred while using. It is necessary to use a spray pump for applying this because unless it is applied in a mist-like spray which coats the leaves thoroughly, it will do no good. If Paris green is used without the Bordeaux, 4 ounces of quick lime to 10 gallons of water must be used to keep it from burning the foliage.

Arsenate of lead is thought to be better than Paris green for such use. Although it costs a little more it is really cheaper, because it gives better protection, is not so likely to burn the foliage and sticks to the leaves better, making fewer applications necessary. Two applications of arsenate of lead will equal four or five of Paris green. Arsenate of lead solution can also be made with less care.

The POTATO-BEETLE sometimes attacks tomato plants, but can be controlled by the spraying or by jarring the beetles into a vessel and destroying them.

The TOMATO HORN worm eats the leaves of the plants and can easily be found. Hand picking and killing is the best way to get rid of them. This large green caterpillar is the larva of one of the sphinx moths, a beautiful creature which I hope you may sometime see flitting through your garden at dusk and getting nectar from tubular flowers with its long beak. This moth lays the eggs which produce these horned caterpillars. You may also find the pupa or winter stage of this insect, which lives in the ground in a brown case having its long beak curved over its body like the handle of a jar.

Another caterpillar which will give trouble is the "FRUIT WORM" which bores into the tomato. In its different generations this same caterpillar lives as the cotton boll worm, and the bud worm of corn. It likes these plants better than the tomato. The fruit worm may be worse if the tomatoes are planted near old cotton or corn fields. Since the moth of this species lays about 500 eggs and there are two, three, or more generations in one season, you will see the advantage of picking off and destroying these worms. Pick off the small tomatoes as soon as infected and either feed them to the hogs or bury them deep in the ground. Spraying with one of the arsenicals mentioned above will help keep this worm out of the fruit. Three weeks or more before fruit ripens, arsenate of lead may be used. Within one week of ripening, if spray is needed use Paris green, which can be more easily washed off the tomato than can the arsenate of lead.

If you have other crops than tomatoes on your tenth acre it is well to know that all insects which can be reached can be poisoned in one of two ways, depending upon their habits. Insects which bite and actually eat the tissue of plants can be killed by the use of arsenic poisons suggested in this letter because they eat the poisoned food. Many insects injure plants by sucking their juices, as do bugs and plant lice. These have to be killed by external poisons which come into contact with their bodies, usually closing their breathing pores and killing them. Soap preparations and kerosene emulsions are used to destroy this class of insects. These preparations must be made with care. Instructions will be sent to any one inquiring for them.

RULES FOR PREVENTING TOMATO DISEASES.

READ AND FOLLOW CAREFULLY.

1. **ROTATION OF CROPS** - do not plant tomatoes in the same soil oftener than once in three years. Find what crop was on the land last year and look out for diseases of other plants which may also infect tomatoes. One of the most serious of these is root-knot which occurs in sandy soils. You can tell it by the knots or galls on the roots. These are caused by very tiny worms called nematodes. Root-knot attacks cotton, cowpeas, melons, okra, beets, tomatoes, potatoes and other plants. Soil can only be freed from this pest by planting it for two or three years in crops which are not attacked by the root-knot, such as Iron cowpeas, corn, oats, velvet beans and peanuts. Be sure that you do not plant your tomatoes where any crop was infected with root-knot last year.
2. **AVOID USE OF FRESH MANURE.** If you did not have well rotted manure plowed under last fall, it will be best not to use any. Using fresh manure in the spring will probably cause disease among your plants.
3. **SPRAY** healthy plants with Bordeaux mixture to protect from disease.
4. Keep plants in good condition by **CAREFUL CULTIVATION.**
5. Pull up and **BURN** all diseased plants promptly.

SPRAYING TOMATOES. To get the best results, spraying with Bordeaux mixture should be begun while the plants are young. Spray once about five days before transplanting, then again five days after transplanting and repeat every ten days until the fruit is full grown. A hard rain will frequently wash off the mixture and make it necessary to spray again. Five sprayings should be given during the season. Ten gallons of spray mixture will be necessary for each spraying. Five pounds blue-stone and five pounds of fresh stone lime will be enough for the season. Secure these supplies at the beginning of the season. Have the blue-stone divided into five one pound-lots. The entire quantity of lime may be slaked at the beginning by adding water slowly until all the lumps are slaked. Keep this slaked lime in a bucket with a little water over it. As long as it is covered with water it is good, but if it is exposed to the air it will dry out and become air slaked. Lime which has been air slaked cannot be used in Bordeaux mixture.

BORDEAUX MIXTURE.	How to make for each spraying.	
Copper sulphate (blue-stone)	.....	1 lb.
Quick lime	.....	1 lb.
Water	.....	10 gals.

BLUE-STONE SOLUTION. Put 5 gallons of water in a wooden tub. Tie the blue-stone in a coarse sack and hang it in this water near the top. Do not use a metal vessel because the action of the blue-stone on the metal will ruin the vessel. Allow several hours for the blue-stone to dissolve. This can be done more quickly by using hot water.

LIME SOLUTION. Take one-fifth of the lime which has been slaked by water and mix it thoroughly in 5 gallons of water.

MIXING. Bordeaux mixture is made out of equal parts of these two solutions. It is important that they be carefully mixed, and that only as much of the mixture be made as can be used at one spraying. Have the lime solution in one vessel and

the copper sulphate solution in another. Have ready a third tub or other wooden vessel. Stir the solution well before using. Let two people pour the two solutions into the third vessel at the same time, stirring constantly to insure thorough mixing. Always stir the Bordeaux mixture before putting into the sprayer.

To be of value, spraying must be thoroughly done. The spray mixture must cover the under side of the leaves as well as the upper.

For the tenth acre, a bucket spray pump costing about \$3.00, or a knapsack sprayer costing about \$5.00, will be satisfactory. Every farm should have one of these sprays, which can be used for many purposes and will more than pay for itself in one year. Wash the spray pump thoroughly after each using.

You will find below a chart which gives a description of some of the more important diseases of the tomato and ways of preventing them.

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INFORMATION CONCERNING TOMATO DISEASES

Disease	Roots	Stem	Leaves	Fruit	Means of Infection, Etc.	Other Plants Infected	Prevention or Control
Tomato Wilt (Fusarium)	Rotten or black inside	Outside normal, inside black	Turn yellow and die	Ripen prematurely	Fungus in soil attacks root and stem		Rotation of crops Burn diseased plants
Early blight (Alternaria Solani)	Normal	Sometimes sunken black spots	Brown or black spots; leaves die and fall	Often black circular rotten spots	Wind and insects carry spores to leaves	Probably causes the Irish potato blight	Spray with Bordeaux Mixture. Burn diseased plants
Root-knot	Galls or knots	Normal	Gradually turn yellow	Normal	Nematodes in soil	Many others (see list above)	Grow crops not attacked by root-knot for 2 or 3 years
Sclerotium blight	Normal	Covered near soil with white mold	Wilt gradually from top downward	Normal	Fungus in soil	Peppers	Prune and stake to allow air to circulate near ground; rotate crops
Southern Tomato blight (Bacterial)	Normal	Slightly discolored on inside	Wilt rapidly	Normal	Carried to leaves mainly by biting and sucking insects	Irish potatoes, egg-plant, weeds of same family	Burn infected plants; spray with Bordeaux Mixture
Leaf spot (Septoria)	Normal	Normal	Small black spots at first; later whole leaf dies; lower leaves attacked first	Normal	Entrance through leaves; growth favored by rainy weather		Spray with Bordeaux Mixture
Downy mildew (Phytophthora)		Turns black and dies; often covered with whitish growth	Leaves attacked first, suddenly die and turn black	Brown rot. Tissue near stem first turns black and shrivels	Usually occurs with septoria	Probably causes late blight of Irish potatoes	Spray with Bordeaux. Burn infected plants
Blossom end rot	Normal	Normal	Normal	Large sunken black or greenish spots on end	Worse in dry weather		No remedy known except irrigation
Anthrachnose ripe rot	Normal	Normal	Normal	Large sunken spots, soft rapid decay	Worse in rainy weather		Preventive measures only; collect and destroy diseased fruit. Prune plants to admit light and air

Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH.
FARMERS' COOPERATIVE DEMONSTRATION WORK
Washington, D. C.

PRESERVING VEGETABLES BY FERMENTATION.

1. The preserving of food products by fermentation has been practiced for centuries. In Europe many fermented substances are common articles of food. In the United States, however, pickles and sauerkraut are the only foods frequently prepared in this manner. A number of vegetables which are commonly preserved by canning can be fermented and kept indefinitely. The following instructions were prepared by Dr. L. A. Round, of the Bureau of Chemistry, and will be useful this season owing to a threatened shortage of tin and glass containers.

2. CUCUMBERS, CHAYOTES, BEETS AND STRING BEANS. Wash the fruit if necessary and pack into a clean water-tight barrel, keg or crock. On the bottom of the barrel place a layer of dill and a handful of mixed spice. When half full add another layer of dill and another handful of spice. When the barrel is full add more dill and spice. If a keg or crock is used the amount of dill and spice can be reduced in proportion to the size of the receptacle. When nearly full add some covering material (see Section 4) and a board cover weighted with stone. Make a brine by adding one pound of salt to ten quarts of water. To each 15 quarts of brine so made add one quart of vinegar. Use enough of this brine to cover the material and allow to ferment.

Cucumbers and chayotes are preferable fermented with the addition of dill and spice, using about three layers of dill and one quart of spice to a barrel. With cucumbers and chayotes, if enough material is available, it is preferable to use the third method of protecting the surface (see Section 5).

The strings should be removed from string beans before fermentation. In case of beets and string beans also, if they are to be served like fresh string beans, the addition of spice is not necessary. Beets, of course, require careful washing to remove all dirt before brining.

3. MAKING SAUERKRAUT IN THE HOME. If properly handled sauerkraut of excellent quality can be produced from cabbage maturing at any season of the year. The essential points are the use of only mature, sound cabbage, scrupulous cleanliness throughout the process and proper care of the surface of the brine after fermentation is completed.

In making sauerkraut for home purposes the outer green leaves of the cabbage should be removed, just as in preparing cabbage for boiling. In addition all decayed or bruised leaves should be discarded and the core removed. Cabbage may be shredded by one of the hand shredding machines sold upon the market for such purposes, or if such an instrument is not available the heads may be cut into thin slices with a large knife. The core is omitted when machine for shredding is not available because it is difficult to shred it finely enough with a knife. The shredded cabbage should be packed immediately into a perfectly clean, water-tight receptacle, such as a cider or wine barrel, keg

or tub. Four or five gallon earthenware crocks are recommended for family use. After opening this quantity of sauerkraut it can be used up before spoilage sets in.

As the cabbage is packed into the barrel or crock, salt in the proportion of one pound of salt to forty pounds of cabbage should be added and distributed evenly throughout the cabbage. Experiments have shown that approximately two and one-half pounds of salt to each hundred pounds of shredded cabbage gives the best flavor to the resulting kraut. When the barrel or crock is nearly full, the cabbage should be pressed down as firmly as possible and covered with a clean board cover. It is advisable but not essential that a clean cloth be placed over the cabbage before the cover is put into place. The salt soon extracts a considerable amount of the juice from the cabbage and a sufficient weight of clean brick or stone should be added to cause the brine to rise above the wooden cover. Care should be taken not to use lime or sand stone for weights, for the acid produced by fermentation attacks the lime and destroys the keeping quality of the brine. Tubs and covers made of yellow or pitch pine should not be employed because such woods cause disagreeable tastes.

The barrel or crock is now set aside and fermentation is allowed to proceed undisturbed. If the weather is cold or the product is stored in a cool cellar it may take three to five weeks for the fermentation to be completed. If placed in a warm room fermentation may be completed in ten days to two weeks. As soon as fermentation starts a foam appears on the surface of the brine. This is soon followed by a film which develops into a heavy scum, if allowed to remain. The scum should be removed by skimming as often as it forms, every day if necessary. This scum feeds upon the acid in the brine and if allowed to grow undisturbed, soon destroys both brine and kraut. As soon as gas bubbles cease arising, the scum should be again removed, if any has formed, and a layer of hot melted paraffin about one-fourth to one-half inch thick should be poured upon the brine (see Section 5). If the sauerkraut is made during the fall and stored in a cool place, there is no absolute necessity of a layer of paraffin, for the low temperature will prevent decomposition. No doubt the popular idea that sauerkraut made from early cabbage will not keep is based upon the fact that the fermentation of sauerkraut made from such cabbage occurs in warm weather and the rapid growth of scum soon destroys both brine and kraut if the surface is not properly protected.

4. COVERING MATERIAL. As described below the surface of fermenting material is subject to spoilage. For protection against such spoilage, it is advisable to place between the vegetables and board cover a layer of clean beet tops, rhubarb or grape leaves at least one inch thick. If any spoilage should occur this layer protects the substances beneath. In case of sauerkraut, clean cabbage leaves can be used.

5. PROTECTING THE SURFACE OF FERMENTING MATERIAL. If uncooked vegetables or fruits are fermented, there will always be more or less bubbling and foaming of the brine during the first stages of fermentation. After this ceases, a thin film will appear, which will spread rapidly over the whole surface and develop quickly into a heavy folded membrane. This scum is a growth of yeast-like organisms which feed upon the acid formed by fermentation. If allowed to grow undisturbed, it will eventually destroy all the acid and the fermented material will spoil. It is very important that this scum be prevented from forming, if the product is to be kept for a considerable time. One important characteristic of this scum is that it will not grow in the absence of air. The free oxygen

of the air is absolutely necessary for its growth. Consequently the exclusion of air from the surface of the brine will entirely prevent the scum from forming. There are three feasible methods of excluding the air. The first method is to use an oil like cottonseed oil, which floats on the surface and effectually prevents air from reaching the brine. Brine with a layer of liquid petroleum or cottonseed oil one-half inch thick on the surface will keep indefinitely. The only objection to liquid oils is the difficulty of getting at the preserved vegetables without getting them covered with oil which is difficult to remove.

The second method is to cover the surface with very hot melted paraffin. If the paraffin is sufficiently hot to make the brine boil when poured upon it, the paraffin will form a smooth even layer before hardening. After solidifying it will effect a perfectly air-tight seal. Paraffin has, in comparison with liquid oil, the advantage of ease in handling, and of not coming in contact with the fermented vegetables when they are removed. Further, paraffin can be used over and over and thus the expense is small in the long run. If it becomes dirty it can be heated very hot and strained through cheese cloth or a thin layer of cotton. The one disadvantage with paraffin is that the development of gas below the layer will break the seal. If the paraffin breaks, it should be removed, remelted and replaced. Before adding paraffin the containers should be set where they will not be disturbed until ready for use. Any attempt to remove them may break the seal and necessitate remelting and resealing.

If cottonseed oil or paraffin is used to cover the brine, it is advisable to so adjust the amount of brine used and weights on the cover that the brine comes up to but not over the cover. In this case only the brine exposed between the cover and sides need be oiled or paraffined, thus saving covering material.

The third method is to pack the barrels as full as possible and replace the head. In using this method of fermentation of beets, cucumbers, chayotes or string beans, fill the barrels as full as possible and add cover and weights. Let stand for 24 hours to allow the initial gas to escape and head up tight. Bore a one-inch hole in the head and fill the barrel full with brine. There should be no air space in the barrel. Allow the barrel to stand until bubbling has stopped. Add more brine if necessary and plug the vent tight. If the barrel does not leak, fermented products put up in this manner will keep indefinitely.

The same method can be used in repacking fermented products in order to economize space and to prevent spoilage of the brine and upper layer of the material. For instance, string beans, beets, sauerkraut, etc., can be transferred after bubbling has ceased in order to fill kegs or barrels. These can be headed up and treated as described above.

The length of time necessary for fermentation to occur depends upon temperature. In a warm place only five days to a week may be necessary; in a cool cellar three to four weeks.

If the material is not opened until cool winter weather, it ought to keep without spoilage until it is used up. If opened in warm weather, it is likely to spoil quite rapidly unless the paraffin is remelted and the container resealed immediately. If the seal is unbroken, the material will keep indefinitely.

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DRYING OF VEGETABLES AND FRUITS FOR HOME USE.

Many vegetables and fruits, which often go to waste, can very easily be conserved for home use by a simple process of drying, which can be done in the average home. Dried products require no outlay for expensive containers and can be stored almost indefinitely under proper conditions in relatively small space. One hundred pounds of fresh vegetables will average ten pounds of the dried product. Vegetables and fruits, if properly dried, retain their natural flavor and food value and when properly cooked can be made into most attractive and wholesome dishes.

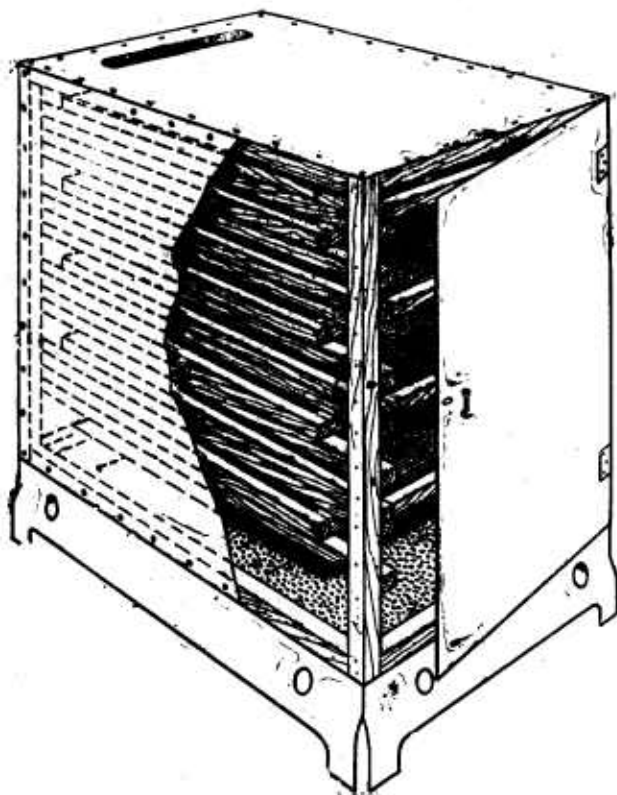
DRIERS OR EVAPORATORS.

Vegetables and fruits can be dried in an even, in trays or racks over the kitchen stove, or in a specially constructed drier. There are small driers on the market which give satisfactory results. The small cookstove driers or evaporators are small oven-like structures, usually made of galvanized sheet iron, or of wood and galvanized iron. They are of such a size that can be placed on the top of an ordinary wood or coal range, or a kerosene stove. These driers hold a series of small trays on which fruits or vegetables are placed after being prepared for drying. Portable out-door evaporators are especially convenient when it is desired to dry as much as ten bushels of fruit or vegetables per day. They are usually constructed of wood except the parts in direct contact with the heater. The homemade dry kiln used in some sections of the country can be cheaply and easily made of brick and stone.

HOMEMADE COOKSTOVE DRIER. A drier that can be used on a wood or coal range or a kerosene stove can be easily and cheaply made. **DIMENSIONS:** Base 24 x 16 inches; height 36 inches. A base 6 inches high is made of galvanized sheet iron. This base slightly flares toward the bottom and has two small openings for ventilation in each of the four sides. On the base rests a box-like frame made of 1 or 1½ inch strips of wood. The two sides are braced with 1½ inch strips which serve as cleats on which the trays in the drier rest. These are placed at intervals of 3 inches. The frame is covered with tin or galvanized sheet iron, which is tacked to the wooden strips of the frame. Thin strips of wood may be used instead of tin or sheet iron. The door is fitted on small hinges and fastened with a thumb latch. It opens wide so that the trays can be easily removed. The bottom in the drier is made of a piece of perforated galvanized sheet iron. Two inches above the bottom is placed a solid sheet of galvanized iron, three inches less in length and width than the bottom. This sheet rests on two wires fastened to the sides of the drier. This prevents the direct heat from coming in contact with the product and serves as a radiator to more evenly spread the heat.

The first tray is placed three inches above the radiator. The trays rest on the cleats 3 inches apart. A drier of the given dimensions will hold eight

trays. The frame of the tray is made of one inch strips on which is tacked galvanized screen wire, which forms the bottom of the tray. The tray is 21 x 15 inches, making it 3 inches less in depth than the drier. The lowest tray when placed in the drier is pushed to the back, leaving the 3 inch space in front. The next tray is placed even with the front leaving a 3 inch space in the back. The other trays alternate in the same way. This permits the hot current of heated air to pass around and over the trays. A ventilator opening is left in the top of the drier through which the moist air may pass away.



The principle of construction is that currents of heated air pass over the product as well as up through it, gathering the moisture and passing away. The movement of the current of air induces a more rapid and uniform drying. The upper trays can be shifted to the lower part of the drier and the lower trays to the upper part as drying proceeds, so as to dry product uniformly throughout.

If drying is done in a cookstove oven, leave oven door ajar. Note temperature of oven often. Trays for use in the oven can be made by using a convenient sized piece of galvanized wire screen and bending up the edge 1 or 2 inches.

DRIED VEGETABLES.

Equally as great care should be given to the selection and preparation of vegetables for drying as for canning. To secure a fine quality of dried products much depends upon having the vegetables absolutely fresh, young, tender and perfectly clean. Wash all vegetables and clean well. If steel knives are used in paring and cutting have them clean and bright so as not to discolor the vegetable.

After vegetables are prepared properly they are blanched. The blanch gives a more thorough cleaning, removes the strong odor and flavor from certain kinds of vegetables and softens and loosens the fiber. This allows the moisture in the vegetable to evaporate more quickly and uniformly. It also quickly coagulates the albuminous matter in the vegetables which helps to mold in the natural flavors. Blanching consists of plunging the vegetable into boiling water for a short time. Use a wire basket or cheese cloth bag for this. After blanching the required number of minutes, drain well and remove surface moisture by placing vegetables between two towels or by exposing to the sun and air for a short time.

The vegetable thus prepared is spread in a thin layer on the trays of the drier. The temperature for drying should be rather low to prevent scorching the

product. For most vegetables, after surface moisture is removed, begin drying at a temperature of 110° F. Increase temperature gradually from 110° to 145° F. and complete drying in 2 or 3 hours. The time required for drying vegetables varies, however, it can easily be determined by a little experience. The material should be stirred or turned several times during the drying in order to secure a uniform product.

It is important to know the temperature of the heat in the drier and this cannot be determined very accurately except by using a thermometer. Inexpensive oven thermometers can be found on the market, or an ordinary chemical thermometer can be suspended in the drier. If a thermometer is not used the greatest care should be given to the regulation of the heat. The temperature in the drier rises rather quickly and the product may scorch unless close attention is given.

GREEN STRING BEANS. All varieties of string beans can be dried. Wash and string the beans carefully. The very young and tender string bean can be dried whole. Those that are full grown should be cut in $\frac{1}{2}$ to 1 inch lengths with a vegetable slicer or a sharp knife. It is better to cut beans than snap them. They are then put in a bag of cheese cloth, or in a wire basket and blanched in boiling water for 6 to 10 minutes, depending on the maturity of the bean. One-half teaspoon of soda may be added to each gallon of boiling water to help set the green color in the bean. Remove surface moisture according to directions given above. Young string beans dry 2 hours, more matured beans 3 hours. Begin drying at a temperature of 110° F. and raise temperature gradually to 145° F. Wax beans are dried in the same manner as the green string beans.

LIMA BEANS. Lima beans can be shelled from the pod and dried. If gathered before maturity, when young and tender, wash and blanch from 5 to 10 minutes. Length of time for blanching depends upon size and maturity of bean. Remove surface moisture and dry from 3 to 3½ hours at same temperature for string beans.

DRY SHELLLED BEANS. Different kinds of beans, after maturing and drying on the vines, can be treated as follows; shell, wash and spread in thin layers on the trays of the drier and heat 10 minutes, beginning at 160° F. and gradually raising the temperature to 180° F. This high temperature will destroy all insect eggs that might be on the beans. Cowpeas or any field pea can be treated in the same way. Cool and store carefully. It might be added that the heating of the bean or pea destroys its vitality and thus treated cannot be used for seed purposes.

GARDEN PEAS. When drying the very young and tender sugar peas use the pod also. Wash and cut in $\frac{1}{2}$ inch pieces, blanch in boiling water 6 minutes, remove surface moisture, and dry the same length of time and at the same temperature as string beans. It is not necessary to use soda when blanching peas.

The garden pea, which has a non-edible pod, is shelled and blanched from 3 to 5 minutes. Remove surface moisture, spread in single layer on trays and dry from 3 to 3½ hours. Begin drying at 110° F., raise temperature very slowly in about 1½ hours to 145° F. Continue drying 1½ or 2 hours at 145° F.

SWEET CORN. Select very young and tender corn, and prepare at once after gathering. Boil or steam on the cob 8 to 10 minutes to set the milk. To improve flavor a teaspoon of salt to a gallon of water may be used. Drain well and cut corn from cob, using a very sharp and flexible knife. Cut grains fine, only half

way down to the cob and scrape out the remainder of grain, being careful not to scrape off any of the chaff next to the cob. Dry from 3 to 4 hours, at 110° to 145° F. When field corn is used, good plump roasting ear stage is the proper degree of ripeness. A pound of dried corn per dozen ears is an average yield.

Corn may be dried in the sun. Dry in oven 10 or 15 minutes and finish drying in the sun. Sun drying is, of course, not satisfactory in moist weather and the dried product will be darker in color and not as attractive in appearance. When dried in the sun it should be heated in the oven before storing, to kill insect eggs.

CARROTS AND PARSNIPS. Clean, scrape or pare, and slice in $\frac{1}{8}$ inch slices. Blanch 6 minutes, remove surface moisture and dry $2\frac{1}{2}$ to 3 hours. Begin drying at 110° F. and raise temperature gradually to 150° F. Kalarabi, Celeraic and Balsify are dried by the same method.

ONIONS AND LEEK. Wash, peel and slice onions in $\frac{1}{8}$ to $\frac{1}{4}$ inch slices. To avoid any unpleasantness peel and slice, holding under water. Blanch in boiling water 5 minutes, remove surface moisture, dry $2\frac{1}{2}$ to 3 hours, beginning at 110° F. and raising temperature gradually to 140° F. Leek is cut in $\frac{1}{4}$ inch strips and dried the same as onions.

BEETS. Boil the whole beets with skin until a little more than three fourths done. Dip in cold water, peel and slice in $\frac{1}{8}$ or $\frac{1}{4}$ inch slices. Dry $2\frac{1}{2}$ to 3 hours, at 110° to 150° F.

PUMPKIN AND SUMMER SQUASH. Pare and cut in about $\frac{1}{8}$ inch strips and blanch 3 minutes, remove surface moisture, and dry slowly from 3 to 4 hours, raising temperature from 110° to 140° F. Celery cut in one inch strips is dried in the same way as pumpkin or squash.

OKRA. Wash, blanch 3 minutes in boiling soda water and dry 2 to 3 hours, at 110° to 140° F. Use $\frac{1}{2}$ teaspoon soda to a gallon of water. Dry young and small tender pods whole. Older pods should be cut in $\frac{1}{4}$ inch slices. Small tender pods are sometimes strung on a string and hung over the stove to dry. If dried in that manner heat in oven before storing.

CABBAGE. Cabbage is shredded or cut in strips a few inches long. Blanch 10 minutes, drain, remove surface moisture and dry 3 hours, at 110° to 145° F.

CAULIFLOWER. Clean, divide in small bunches, blanch 6 minutes and dry 3 to $3\frac{1}{2}$ hours at 110° to 145° F. Cauliflower will turn very dark when drying, but will regain part of color in soaking and cooking. Dried cauliflower is especially good in soups and omelets. For drying brussel sprouts treat like cauliflower and add pinch of soda to blanching water,

PEPPERS. Peppers may be dried by splitting on one side, removing seed, drying in the air and finished in the drier at 140° F. A more satisfactory method is to place peppers in biscuit pan in oven and heat until skin blisters or steam peppers until skin softens. Peel, split in half, take out seed and dry at 110° to 140° F. In drying thick fleshed peppers like the pimento do not increase heat too quickly but dry slowly and evenly. Small varieties of red peppers may be spread in the sun until wilted and the drying finished in the drier or they may be entirely dried in the sun.

VEGETABLE SOUP MIXTURES. Each vegetable used in the soup mixture is prepared and dried separately. They are put together in proportions desired; the desired flavored vegetable predominating. A combination of several vegetables makes a most desirable soup mixture. Those most often used are carrots, cabbage, onions, celery and okra.

HERBS, ETC. Celery tops, parsley, mint, sage and herbs of all kinds need not be blanched, but washed well and dried in the sun or in drier. These are good for flavoring soups, purees, gravies, omelets, etc.

STORING DRIED VEGETABLES.

When vegetables are first taken from the drier, if completely dried they are very brittle. They are more easily handled and are in better condition for storing if allowed to stand 1 to 3 hours to absorb enough moisture to make them more pliable before putting into bags or storing otherwise. If it is not convenient to store products immediately and they are allowed to stand several days, they should be heated to 160° F. to destroy any insect eggs that might be on them. Care should be taken not to heat the vegetable higher than 160° F.

Dried vegetables should always be stored in moisture proof containers and in a dry place free from dust and dirt. The best container is a tin box, bucket or can fitted with a perfectly tight cover. Perhaps the most convenient and cheapest container is the small paper bag. A small amount should be put in each bag, just enough to use for one or two meals. This will prevent the opening of any dried product that cannot be consumed in a short time. The upper part of the bag is twisted to form a neck. The neck is bent over and tied tight with a string. The entire bag is then painted with a coat of melted paraffin, using a small brush or a frayed end of a piece of rope. This makes the bag practically moisture and insect proof. To further protect from the insect ravages, label and pack bags in a tin container with a tight fitting cover. A large number of bags could be stored in an ordinary lard can. A glass jar with a tight seal is a good container for dried products. Paraffin coated paper containers of various sizes can be found on the market. If such containers are used they should also be stored as the paper bags. A list of companies from whom such containers can be purchased will be furnished by this Office upon request.

All dried products should be examined occasionally. Upon the first appearance of insects, spread in thin layers in the sun until insects disappear; then heat at a temperature of 160° F. and re-store carefully.

DRIED FRUITS.

In very dry climates fruits are usually dried in the sun. Most fruits dried in the sun discolor unless especially treated. For drying fruits in small quantities for home use only the small drier is satisfactory. On very hot dry days fruits may be dried in the sun until surface begins to wrinkle and then finished in the drier. Only fresh ripe fruits should be used.

The ideal moisture content of dried fruits is about 23%. The ability to judge accurately as to when the fruit has reached the proper condition for removal from drier can only be gained by experience. When sufficiently dried it

should be so dry that it is impossible to press water out of the freshly cut ends of the pieces, and will not show any of the natural grain of the fruit on being broken, yet not so dry that it will snap or crackle. It should be leathery and pliable.

Before spreading fruit on the trays of the drier line the tray with wrapping paper or cheese cloth. There is a possibility of the acid of the fruit acting upon the zinc. After drying cool quickly, as fruit when cooled slowly shrivels and looks unattractive.

BERRIES. Wash berries, free from leaves and stems, and remove surface moisture. Handle carefully and do not bruise. Spread in a thin layer on tray and dry slowly. Raise temperature gradually from 110° to 125° in about 2 hours. Do not raise temperature higher than 130° until a considerable portion of moisture has evaporated, as otherwise there will be expansion and loss of juice by dripping. This is accompanied by loss of flavor and color. Finish drying berries at 140° from 2 to 3 hours. The whole process of drying berries takes from 4 to 5 hours.

CHERRIES. Wash, remove surface moisture and spread cherries unseeded in thin layer on trays. If cherries are seeded there will be a loss of juice. Dry from 3 to 4 hours, at 110° to 150° F. Raise temperature gradually.

PLUMS. Select medium ripe plums, cover with boiling water, cover the vessel and let stand twenty minutes. Small thin fleshed varieties are not suitable for drying. Drain, remove surface moisture, and dry from 4 to 6 hours, gradually raising temperature from 110° to 150° F.

APPLES AND PEARS. Pare, core and cut apples in one-eighths, or core and slice in rings using fruit or vegetable slicer. As apples discolor quickly do not let stand long before drying. To prevent discoloration as the fruit is prepared it may be dipped for one minute in a cold salt bath, using 1 ounce of salt to 1 gallon of water. Remove surface moisture and dry at 110° to 150° F., raising temperature gradually. Dry from 4 to 6 hours, and longer if necessary. Pear are dried in the same way as apples. They may be steamed 10 minutes before drying.

PEACHES. Peaches are usually dried unpeeled. They may be peeled if desired. Cut in halves, pit, lay in trays pit side up, and dry at same temperature and for same length of time as apples.

Store dried fruits in the same way as dried vegetables.

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Washington, D. C.

USE OF POULTRY CLUB PRODUCTS.

Since many women in the Home Demonstration Clubs and girls in the Poultry Clubs are working with poultry, we have a demand for information on the use of poultry products to be used in demonstrations. The following material is prepared to meet this demand. It is important that the agents in their public demonstrations stress the use of only a few of the recipes at one time. Note especially the different uses of tomato sauce, which is one of the concentrated mixtures that we are stressing in the canning work.

Throughout the instructions we would stress the fact that eggs should be cooked at a low temperature if the greatest enjoyment and value of food is to be obtained from eating them. Cooking eggs at a low temperature will keep them from becoming tough, which state renders them less digestible. All measurements are level and should be carefully made. The abbreviations used are: tbsp. = tablespoonful; tsp = teaspoonful; c. = cup.

SIMPLE WAYS OF COOKING EGGS.

SOFT COOKED EGGS: Heat the water in the sauce pan to the boiling point. Remove from fire and place eggs in the water with a spoon. Cover the pan and allow to stand 6 to 8 minutes, keeping the water at the same temperature. The water should be deep enough to entirely envelop the eggs. Remove the eggs and serve immediately.

Allow them to stand 15 to 20 minutes if MEDIUM HARD COOKED EGGS are desired.

HARD COOKED EGGS: Place eggs in a sauce pan of cold water and allow to slowly come to the boiling point. As soon as it begins to boil remove from fire and cover the pan. Let stand for 30 minutes, keeping the temperature even. Chill in cold water; remove shell and serve.

POACHED EGGS ON TOAST: Break each egg into a saucer. Combine an equal quantity of milk with water and let this reach the boiling point. Carefully slip the egg into the boiling liquid, cover, and remove from fire. Cook until the white is firm, and baste the yolk to form a film over it. Take up carefully with a skimmer and serve on slices of toast. Season to taste.

STEAMED EGGS: Butter slightly the bottom of custard cup and slip an egg into it. Place the cup in a pan of gently boiling water (water should come half way up side of cup); cover and steam until white of the egg is done. Steamed eggs may be served on crisp toast if desired.

POACHED EGGS AND TOMATO SAUCE: Allowing $\frac{1}{2}$ tbsp. of salt to one quart of water, have a shallow pan $\frac{2}{3}$ full of boiling water. Break each egg separately into a saucer and slip them into the water. Cook as for poached eggs

and serve with the following sauce.

2 c. canned tomatoes &	$\frac{1}{4}$ tsp. salt	$\frac{1}{8}$ tsp. pepper
1 slice onion	2 tbsp. butter	
or 1 c. tomato sauce	2 tbsp. flour	

Cook tomato and onion 20 minutes, then rub through a strainer. Melt the butter, add dry ingredients and strained tomatoes. Tomatoes will retain their red color if the flour is browned before using. Pour this sauce over the eggs and serve.

BAKED EGG DISHES:

SHIRRED EGGS: Cover the bottom and sides of a small baking dish, preferably an earthen one, with fine bread or cracker crumbs. Break each egg into a saucer and carefully slip it into the dish. Cover with seasoned buttered crumbs and bake in a moderately hot oven until the whites are firm and crumbs are a golden brown.

EGG IN NEST: Carefully separate the white from the yolk of an egg. Beat the white until stiff and pile lightly on a nicely trimmed slice of toast. With a spoon make a depression in the top of the white and slip the egg yolk into it. Place on a baking dish in a moderate oven and when the white has become a golden brown remove and serve. It may be seasoned to taste.

EGGS BAKED IN TOMATO: Cut a slice from the stem end of a small tomato and scoop out part of the pulp. Refill this with an egg, sprinkle with salt and pepper, and add a few small bits of butter. Cover the opening with buttered crumbs and bake in a moderate oven until crumbs are a golden brown.

EGGS COMBINED WITH SAUCES:

EGGS GOLDENROD:

1 c. milk	$1\frac{1}{2}$ tbsp. flour	$\frac{1}{2}$ tsp. salt
2 tbsp. butter	4 hard cooked eggs	6 slices toast
$\frac{1}{4}$ tsp. white pepper	1 tsp. chopped parsley	

Melt the butter, add the dry ingredients and stir until smooth. Add the heated milk slowly, stirring constantly, and allow to come to the boiling point. Separate the yolks from the whites of the hard cooked eggs. Chop the whites finely and add them to the white sauce. Cut the slices of toast in half and after arranging on the platter, pour the sauce over them. Put the yolks through a potato ricer or press them through a strainer, sprinkling them over the sauce. Garnish with parsley and serve.

DELICATE EGGS:

$1\frac{1}{2}$ tbsp. butter	$\frac{1}{2}$ tsp. salt	6 eggs
$\frac{1}{8}$ tsp. pepper	$\frac{2}{3}$ c. milk	

Break eggs into a bowl and beat only enough to break the yolks. Add the seasoning and milk. Pour mixture into the upper part of a double boiler in which the butter has been melted. Continually stir and scrape from the bottom of the pan, allowing to cook until of a creamy consistency.

DUTCH EGGS:

6 hard cooked eggs	1 c. white sauce
$\frac{1}{2}$ c. grated cheese	1 sweet red pepper cut into strips.

Cut the eggs into quarters and place about $\frac{1}{4}$ of the amount in a buttered baking dish. Cover this layer with sauce, and sprinkle over it a layer of the cheese; then a few pieces of the pepper. Repeat until the dish is full. Sprinkle bread crumbs on top, dot with butter and brown in a hot oven.

ESCALLOPED EGGS:

2 tbsp. butter	1 c. milk	$\frac{1}{8}$ tsp. pepper
2 c. bread crumbs	$\frac{1}{2}$ tsp. salt	1 c. tomato sauce
6 hard cooked eggs	2 tbsp. flour	
2 c. cooked macaroni	3 tbsp. grated cheese	

Make a sauce of the flour, butter, salt and pepper, and remove from the fire to add grated cheese. Stir until melted. Combine carefully the cooked macaroni, sliced egg and salt. After covering bottom of baking dish with buttered crumbs add the mixture. Then add rest of crumbs, brown in hot oven and serve with tomato sauce.

STUFFED EGGS:

$\frac{1}{2}$ tsp. salt	$\frac{1}{2}$ tsp. paprika	1 tsp. olive oil
$\frac{1}{2}$ tsp. mustard	1 tsp. vinegar	butter
$\frac{1}{8}$ tsp. pepper	6 hard cooked eggs	

Cut the eggs in half, length-wise. Remove yolks and place them in a bowl. Mash thoroughly and add the seasoning, vinegar and oil. Add enough butter to make mixture of right consistency to shape. Make into balls the size of the original yolks and refill whites. Arrange on a serving dish and if desired to serve hot, pour around them one cup of white sauce. Cover and reheat.

CREAMED EGGS:

1 c. milk	$\frac{1}{2}$ tsp. salt	2 tbsp. flour
4 hard cooked eggs	2 tbsp. butter	$\frac{1}{8}$ tsp. pepper

Separate whites from the yolks of the hard cooked eggs. Make a white sauce and add to this the yolks which have been pressed through a strainer. The whites may be cut into small pieces and also added to the sauce. Creamed eggs are particularly nice when served on toast.

OMELETS.

PLAIN OMELET:

$\frac{1}{2}$ tsp. salt	3 eggs	$\frac{1}{8}$ tsp. white
2 tsp. butter	3 tbsp. hot water	pepper

Beat the yolks of the eggs until light and creamy. Add salt, pepper and milk. Beat whites until stiff and fold them into the yolks. Heat a small frying pan and put in enough butter to cover the bottom of the pan, turn in the omelet and spread it evenly. When the omelet is set, carefully fold and turn out onto a hot platter. Serve immediately.

FRENCH OMELET:

$4\frac{1}{2}$ tbsp. milk	4 eggs	$\frac{1}{16}$ tsp. pepper
2 tbsp. butter	$\frac{1}{2}$ tbsp. salt	

Beat the eggs slightly, just enough to mix yolks and whites, then add the milk and seasoning. Put the butter in a small hot frying pan and when melted turn mixture into the pan. While this is cooking, mix slightly with a fork until the whole is of a creamy consistency. Place on a hotter part of the fire and allow to brown quickly underneath. Fold and turn on a hot platter.

SPANISH OMELET: Mix and cook a French omelet. Serve with tomato sauce in the center and around the omelet:

TOMATO SAUCE:

2 tbsp. butter	cayenne	$\frac{1}{2}$ tsp. salt
$1\frac{1}{2}$ tbsp. onion	$\frac{1}{2}$ tbsp. capers	
1 c. tomatoes	3 tbsp. mushrooms	

Brown onion (finely chopped) in the butter. Cook the tomatoes with the onion for 15 minutes. Add the capers, mushrooms and seasoning. If desired substitute 3 tbsp. peas and 2 tbsp. chopped red peppers for the capers and mushrooms.

EGG SOUFFLE:

2 tbsp. butter	5 eggs	cayenne
$1\frac{1}{2}$ tbsp. flour	$\frac{1}{2}$ c. cream	
$1\frac{1}{2}$ c. milk	1 tsp. salt	

Cream the butter, add the flour and gradually the scalded milk and cream. Cook in double boiler five minutes and add yolks of eggs which have been beaten until lemon colored. Add seasoning and fold in stiffly beaten whites. Turn into a buttered dish, set in a pan of hot water and bake in slow oven until firm.

CUSTARDS.

SOFT CUSTARD:

1 c. milk	2 eggs	$1/16$ tsp. salt
vanilla	2 tbsp. sugar	

Heat the milk in a double boiler. Mix the eggs in a bowl with the sugar and salt. Add hot milk slowly, stirring, and return mixture to the double boiler. Cook until custard will coat a silver spoon. Strain and serve. If the custard curdles, set the pan into cold water and beat the custard until smooth.

STEAMED OR BAKED CUSTARD:

1 pt. milk	$\frac{1}{8}$ tsp. nutmeg	$\frac{1}{8}$ tsp. salt
2 eggs	$\frac{1}{4}$ c. sugar	

Mix eggs as for soft custard. Strain into custard cups and steam until firm over hot water which is boiling gently. To bake: strain the custard into cups and place in a pan of warm water. Bake in a moderate oven until the custard is firm. To test a steamed or baked custard, slip a knife blade to the bottom of the cup in the center of the custard and draw out without turning. If the knife is not coated the custard has cooked enough. Grate the nutmeg over the surface and cool before serving.

FLOATING ISLAND:

$2\frac{1}{2}$ c. milk	$\frac{1}{2}$ c. sugar	$\frac{1}{2}$ tsp. vanilla
$\frac{1}{8}$ tsp. salt	5 eggs (yolks)	

Prepare as a soft custard. The whites should be beaten light and 6 tsp. of powdered sugar added for the meringue. When the custard is cool it may be poured into sauce dishes and the meringue dropped in large spoonfuls into it.

CUSTARD PUDDING:

$\frac{1}{2}$ c. pearl tapioca or rice		
2 eggs (yolks)	$\frac{1}{2}$ c. sugar	2 eggs (whites)
$\frac{1}{2}$ tsp. vanilla	2 c. milk	$\frac{1}{8}$ tsp. salt

Soak the tapioca in enough hot water to cover it, until it absorbs the water. Add the milk and cook in a double boiler until the tapioca is soft and transparent. Combine the yolks of eggs with sugar and salt and add to the mixture in the double boiler. Cook ten minutes. Add stiffly beaten whites and flavoring and when cold, serve. Rice must be cooked in boiling water until soft.

APPLE WHIP:

2 c. apple sauce 4 eggs (whites) Cream for serving
Cook 6 or 8 medium size apples until soft in just enough water to keep them from burning. Add sugar to sufficiently sweeten and 1/8 tsp. grated nutmeg. Cool. Press the apple sauce through a strainer and add to it the stiffly beaten whites of eggs. Beat until light and foamy. Pile onto saucers and serve with fresh cream or a custard sauce made of the egg yolks. This sauce may be prepared by the same method as for soft custard, omitting the whites of eggs. Canned fruit such as peaches, figs, cherries or guava may be substituted in the same proportion as the apples.

EGG SALAD AND SANDWICHES

STUFFED EGG SALAD:

Crisp lettuce 6 stuffed eggs Mayonnaise
Follow recipe for stuffed eggs. Arrange 2 half eggs in nest of crisp fresh lettuce on salad dishes. Add mayonnaise dressing. Garnish with strips of sweet red pepper and serve.

EGG SANDWICHES:

6 hard cooked eggs Mayonnaise or salad dressing
Remove the yolks and mash them thoroughly. Add mustard, salt, and pepper to taste and combine with enough mayonnaise to make of proper consistency to spread. Slice the whites very thin. Have bread cut thin and spread one slice with yolk mixture: add a few slices of the whites and place on other slice of bread which has been thinly buttered. Sandwiches may be kept fresh by folding in a damp napkin over which has been placed a dry napkin. Wrapping in paraffin paper is also an effective method.

METROPOLITAN SANDWICHES

1 tsp. prepared mustard
1/2 lb. cheese 3 hard cooked eggs 1/4 tsp. pepper
3 tbsp. melted butter 3 tbsp. cider vinegar 1/2 tsp. salt

Mash yolks, add butter, salt, pepper and mustard, and mix until smooth. Grate cheese or put through a food chopper; chop whites of eggs. Mix all thoroughly, stir in vinegar, and spread between three or four thin slices of buttered bread; press together, and cut in long, narrow strips.

EGG SAUCES AND DRESSINGS.

HOLLONDAISE SAUCE:

1/2 c. butter 1 1/2 tbsp. lemon juice 1/2 tsp. salt
2 eggs (yolks) 1 c. boiling water 1/16 tsp. cayenne

Cream the butter, add the yolks one at a time and beat well; then add the lemon juice, salt and pepper. A short time before serving add boiling water. Cook over boiling water and stir until the mixture is of the consistency of

custard, then serve immediately.

This is a delicious dressing to serve with cauliflower, asparagus tips or with fish.

EGG SAUCE FOR FISH:

$\frac{1}{2}$ c. butter	3 hard cooked eggs (cut in $\frac{1}{2}$ in. slices)
2 tbsp. flour	$1\frac{1}{2}$ c. boiling water $\frac{1}{3}$ tsp. salt

Melt the butter, add flour and seasoning and gradually the boiling water. Add sliced eggs and serve.

MAYONNAISE DRESSING:

$\frac{1}{2}$ tsp. mustard	1 c. olive or wesson oil
$\frac{1}{2}$ tsp. salt	2 tbsp. vinegar or lemon juice
2 eggs (yolks)	cayenne

Mix yolks and add mustard, salt and cayenne. Add the oil a few drops at a time and stir steadily. When half the oil has been used, or when the dressing becomes very thick, alternate with a few drops of vinegar. Continue this process until both are used. If the dressing curdles, start the process over again, beginning with a fresh yolk in a clean bowl, adding a little of the curdled dressing at a time and stirring constantly.

COOKED SALAD DRESSING:

$\frac{1}{4}$ tbsp. mustard	1 tbsp. sugar	2 eggs
$\frac{1}{4}$ tbsp. salt	$\frac{1}{2}$ c. sweet milk	2 tbsp. butter
2 tbsp. flour	$\frac{1}{8}$ tsp. cayenne pepper	$\frac{1}{2}$ c. vinegar

Rub together the dry ingredients and add egg yolks, slightly beaten. Add melted butter, cold milk, and hot vinegar in the order named, stirring until perfectly smooth. Cook the mixture in a double boiler until thickened. Set the pan into a bowl of cold water and beat well until cool and smooth.

GOLDEN DRESSING:

$\frac{1}{4}$ c. lemon juice	6 tbsp. sugar
$\frac{1}{4}$ c. light colored fruit juice	2 eggs (yolks)

Beat the eggs, add the fruit juice, stir gradually into the lemon juice and add the sugar. Cook in a double boiler and stir until the mixture coats a spoon. Cool quickly by placing pan into cold water, beating the mixture at the same time. This dressing is combined with fruits to be served as salads or desserts. Some attractive combination of Canning Club products are:

1. Canned peaches, cherries, and fresh apples, using cherry juice with the lemon in the dressing.
2. Canned figs, fresh oranges, and pecans, using orange juice in the dressing.
3. Guava, pineapple, and grapefruit, using pineapple juice in the dressing.
4. Canned berries or fresh grapes, apples, and pears, using scuppernong juice in the dressing.

Any of these dishes may be made especially attractive by garnishing them with nuts, whole cherries, berries, or marshmallows.

RECIPES FOR USE OF CHICKEN.

DRESSING AND CLEANING: Remove feathers. Hold the bird over a flame to

remove hair and down, constantly changing the position until all parts of the surface have been exposed. Cut off the head and draw out the pin feathers, using a small pointed knife. Cut through the skin around the leg, about $1\frac{1}{2}$ in. below the leg joint, care being taken not to cut the tendons. Snap the bone and take the foot in your right hand, holding the bird firmly in the left, pull off the foot and with it the tendons. In old birds the tendons must be drawn separately, which is best accomplished by the use of a steel skewer. Make an incision through the skin below the breast bone, just large enough for the hand, and remove the entrails, gizzard, heart and liver. The three last named are called giblets. The gall bladder, lying just under the surface of the liver, is removed with the liver, care being taken not to break it. Inclosed by the ribs and on either side of the back bone are the lungs, which are bright red in color and spongy. These must be entirely removed. Remove also the kidneys, which lie in the hollow near the end of the back bone. The windpipe may easily be removed by putting two fingers under the skin close to the neck. Remove the crop, which will be found adhering to the skin close to the breast. Draw down the neck skin and cut off the neck close to the body, leaving the skin long enough to fasten under the back. Remove the oil bag and wash the bird, allowing cold water to run through it but not allowing the bird to soak in the water. Wipe inside and out and examine carefully to see that everything has been removed.

TRUSSING: Draw the thighs close to the body and hold by inserting a steel skewer under the middle joint, running it through the body and coming out under the middle joint on the other side. Cut a piece about an inch wide from the neck skin, and with it fasten the legs together at the ends; or cross the drum sticks, tie securely with a long string and fasten to tail. Place the wings close to the body and hold them by inserting a second skewer through the wing, body and wing on opposite side. Draw the neck under the back and fasten with a smaller wooden skewer. Turn the bird on its breast, cross the string attached to the tail and draw it around each end of the lower skewer; again cross the string and draw around each end of upper skewer, fasten the string in a knot and cut off the ends.

CHICKEN BROTH:

$1\frac{1}{2}$ lbs. meat and bone 1 qt. cold water salt

Draw, singe, clean thoroughly and disjoint the fowl. After removing the meat from the bones grind it and then add the bones. Put all in a sauce pan, add the water and stand for 15 minutes in a cold place. Cook over moderate heat in a double boiler for 6 or 8 hours, or cook in a fireless cooker. Strain and season. When cold, remove the fat, reheat and serve.

STEWED CHICKEN: Dress and cut up medium size chicken. Put into a kettle and cover with water. Add salt and simmer slowly several hours, until the meat is very tender. After lifting out the chicken make a thickening, using 2 tbsp. flour and adding 1 pt. of the stock for gravy. Season to taste.

Dumplings may be cooked in the stock and served with gravy.

Chicken prepared in this way may be cooked in a fireless cooker.

BROILED CHICKEN: Singe and wipe, and with a sharp knife cut through the back bone the entire length of the bird. Lay open the bird and remove the contents. Remove the ribs and breast bone and cut the tendons at the joints. Sprinkle with salt and pepper, place in a well greased broiler and broil for about twenty minutes over a clear fire, turning frequently so that all parts may be equally browned. Remove to a hot platter and spread with soft butter.

BAKED CHICKEN DISHES.

BAKED CHICKEN: Dress, clean, stuff and truss the chicken. Place on its back in a baking pan, rub the entire surface with salt, then spread two tablespoonfuls of butter on the breast and legs. Dredge the bottom of the pan with flour, place in a hot oven and when flour is well browned, reduce the heat and then baste. Continue basting every ten minutes until chicken is cooked. For basting, use one tablespoonful of butter melted in 2/3 cup of boiling water and after this has gone, use the fat in the pan. During the cooking turn the chicken frequently to brown it evenly. If a glazed surface is preferred do not dredge during the baking, but if a crusted surface is desired, dredge with flour during the baking. When the breast meat is tender the bird is sufficiently cooked. A four pound chicken requires about 1½ hours. This method of baking chicken can be used in a fireless cooker provided heated discs or soap stones are used to furnish sufficient heat to brown it.

ESCALLOPPED CHICKEN: Slightly butter an earthen baking dish, put into it a layer of cold cooked chicken which has been sliced or cut in cubes, then a layer of rice or boiled macaroni. Alternate until the dish is full and pour over it tomato sauce. Cover with buttered bread crumbs and bake in a hot oven until brown.

CHICKEN SOUFFLE:

1½ c. scalded milk	2 c. cold cooked chicken	½ tsp. pepper
1/3 c. butter	2 eggs (yolks) well beaten	
3 tbsp. flour	½ tbsp. parsley, chopped	
½ c. soft bread crumbs	2 eggs (whites) beaten stiff	

Make a sauce with butter, flour, salt, pepper and milk. Add the bread crumbs and let stand until thoroughly blended. Add chicken, yolks of eggs and parsley and fold in the stiffly beaten whites. Turn into a buttered baking dish and bake thirty minutes in a slow oven. Serve immediately.

CHICKEN COMBINED WITH SAUCES.

CREAMED CHICKEN ON TOAST:

2 c. cold cooked chicken	1 c. milk	6 slices toast
2 tbsp. butter	¼ tsp. salt	
2 tbsp. flour	½ tsp. celery salt	

Make a white sauce and heat the chicken in the sauce. Add the celery salt, pour the chicken over the toast and serve.

CHICKEN A LA KING:

1 tbsp. chicken fat	½ c. chicken stock	½ c. cream
1 tbsp. flour	1/3 c. salted mushrooms	¼ c. milk
1/3 c. canned pimientos	2 eggs (yolks)	2 tbsp. butter
1 c. cold boiled fowl, cut in strips or cubes		½ tsp. salt

Melt the fat, add flour and stir until smooth. Add gradually the stock, milk and cream. When this boils add salt, butter, fowl, mushrooms and pimientos. Let it come to the boiling point and add egg yolks slightly beaten. Serve on toast.

CHICKEN SALAD:

1 c. cold cooked chicken	Mayonnaise dressing	1 c. celery
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Cut chicken into half inch cubes. Cut celery into small pieces and combine with chicken. Add enough mayonnaise dressing to make it possible to mold the salad. Serve on crisp lettuce leaves and garnish with slices of hard cooked eggs.

CHICKEN COOKED IN THE FIRELESS COOKER.

STUFFED CHICKEN: Dress medium size chicken and stuff with bread stuffing. Sear it in the oven for 15 minutes. Place in fireless cooker and when hot soap stones are used, cook 2 hours or until thoroughly tender. Without hot soap stones, cook 3 hours.

CREOLE CHICKEN:

1 medium sized chicken	1 bay leaf
6 tomatoes or 1 #2 can tomatoes	1 tbsp. chopped parsley
3 sweet red peppers cut in small cubes	2 tsp. salt
3 sweet green " " " " "	1 onion (size of egg)
(or 1 #2 can peppers)	2 tbsp. butter or bacon

$\frac{1}{4}$ pound ham or 2 or 3 slices of bacon chopped finely. (drippings)

Place the chicken with 1 c. boiling water in the fireless cooker vessel, cover and simmer for $\frac{1}{2}$ hour. Brown the chopped onion in the fat. Simmer tomatoes for 15 minutes with the bay leaf, strain, and pour over the onions. Add minced ham and parsley and cook for 15 minutes longer. To this mixture add the chopped peppers and chicken stock and bring to a boil. Place the chicken in the cooker vessel, pour over the mixture of vegetables and let it boil five minutes. Put at once into the fireless cooker. With hot soap stones let the chicken stay in the cooker for 2 hours; without soap stones, for 3 hours.

BREAD STUFFING:

1 c. bread	$\frac{1}{4}$ c. boiling water	thyme
$\frac{1}{3}$ c. butter	salt and pepper	sage

Add seasoning to the bread crumbs and pour boiling water, to which the butter has been added, over the bread crumbs.

CHICKEN SPAGHETTI: Stew the chicken in part of the fireless cooker and cook spaghetti in another container of the cooker. The spaghetti should be boiled five minutes over the fire, well covered with boiling salt water and then put into the fireless cooker. When the chicken is tender, remove from the stock and make the gravy. Arrange spaghetti on platter and place chicken on it and pour the gravy over it. This might also be served with tomato sauce.

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Assistants in Home Demonstration Work.

Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH.
FARMERS' COOPERATIVE DEMONSTRATION WORK.
Washington, D. C.

SELECTION AND PREPARATION OF SOIL FOR TOMATOES; MAKING HOT BED.

TO CANNING CLUB MEMBERS:

This letter contains rules for beginning work, instructions for the selecting of the one-tenth acre garden plot and the making of a hot bed. There will follow letter No. 591, giving further instructions on the preparation of the soil, setting the plants and cultivating the garden; letter No. 629, on Tomato Diseases and Insect Pests, and B-511-i, Daily Record Book for Canning Clubs.

Please keep this letter and the ones which follow, read the instructions carefully and refer to them often. You will thus be sure that you are following directions. Your county agent will give you a Daily Record Book and teach you how to keep it. Begin writing in this book as soon as you do your first work. Continue making notes each day you do any work throughout the entire season. Write to your county agent if you need further information.

RULES FOR BEGINNING WORK.

1. Secure a tenth acre of ground; this may be 132 ft. long and 33 ft. wide, or any other convenient width and length, provided it contains one-tenth acre, or 4,356 square ft.
2. When you have finished your work next summer, we shall ask you to write a history of it, so begin at once to record (a) the date, (b) number of hours, (c) kind of work and (d) cost.
3. Keep a record of your expenses, charging 10 cents an hour for your own work. For all hired work and supplies, charge the actual cost. Estimate the value of stable manure at \$2.00 per ton, allowing a good two-horse load for a ton. Charge yourself \$1.00 for the rent of your tenth acre.

SELECTION OF SOIL.

Select a piece of well drained sandy loam soil, preferably one nearly level.

1. Avoid soil that has been in tomatoes the previous year, especially if there has been any disease on the plants, as some of the diseases live over winter in the soil. Soil where cotton has been injured by the nematode or root knot should also be avoided.

Plow the soil six to eight inches deep in the fall or early winter and apply two to three wagon loads of well rotted manure to your tenth acre plot. Leave the soil rough during the winter to prevent washing. If no well rotted manure is available use coarse manure, apply it before plowing and turn it under so that it will decay before spring.

VARIETY OF TOMATOES TO PLANT.

Where there is any prospect of an early local market for tomatoes it is advisable to plant about one-fourth of the plot to an early variety like Earliana. Plant the remainder of the plot to a good strain of Stone tomato. Where no market is available a few early tomatoes should be planted for home use and the remainder of the plot planted to the Stone for canning purposes.

STARTING THE PLANTS

To get an early crop it is necessary to start the plants during the winter. The best method is to sow the seed in a hot bed in rows two to three inches apart, and when the plants have developed their first true leaves transplant them to stand about two inches apart each way. This transplanting should be done in shallow boxes filled with good rich soil or direct to another part of the bed. For the general crop, grown for canning purposes, this transplanting is all that is necessary until ready to plant to the field. For extra early tomatoes it is advisable to again transplant the plants when they reach a height of four or five inches. This time plant in three or four inch flower pots, strawberry boxes, or tin cans which have had the tops and bottoms melted off. When grown in this way the plants can be left in the bed or cold frame until the blossoms begin to open.

MAKING A HOT BED.

Select a well drained location, where the bed will be sheltered, preferably on the south side of a building or fence. Make an excavation eighteen inches deep the size your bed is to be. Throw in fresh horse manure and pack by tramping. The manure heap should be about even with the surface of the ground or eighteen inches deep. The manure furnishes the heat to start the plants. Put on top of the manure four or five inches of a good garden loam, which has not grown any diseased plants, and cover the bed with glass hot bed sash. If sash can not be secured, canvas may be substituted. The temperature will run high for a few days, but no seeds should be planted until the temperature falls to about 80 degrees F., which will require three or four days.

A bed made about five feet nine inches wide and about six feet long will be plenty large enough to grow plants for a tenth acre garden. This size bed will take two hot bed sashes which measure three feet by six feet. The frame to support the sash should be about fifteen to eighteen inches high at the back and six inches lower in front in order to drain off the water. The slope should be toward the south.

During the bright days the bed will heat very quickly and it will be necessary to ventilate by raising the sash on the opposite side from the wind. Toward evening close the sash in order to get the bed warm before night. Water the bed in the morning on bright days as watering in the evening or on cloudy days will have a tendency to injure the plants and increase the danger of freezing and damping off. Ventilate the bed after watering in order to dry off the plants.

Before the plants are set out, they should be hardened off and this can be done by transferring to a cold frame or by removing the hot bed sash during the, day time in mild weather. As the plants become hardened the sash can be kept off on nights when there is no danger of frost. This hardening off process must be done gradually to prevent any serious check to growth.

If it is impossible to make a hot bed, the plants can be started in shallow boxes in the house. Get shallow boxes from a store and fill with good, rich soil and sow the seed as described for the hot bed. Bore two or three holes in the bottom of the box for drainage. Keep the box as near a window as possible and at living room temperature, about 70 degrees. Close attention should be given to watering, as the air of a living room is usually dry and will soon dry out the soil. The plants must be developed in the light or they will be weak and spindling. They should be transplanted to other boxes or to a cold frame, which is made in the same way as the hot bed except that the manure is left out and canvas may be substituted for the glass sash. In the far South it will not be necessary to have a hot bed; the cold frame will be sufficient.

In the preparation of this letter, valuable assistance was given by Mr. H. C. Thompson of the Bureau of Plant Industry.

Sincerely yours,

MARY E. CRESWELL.

ASSISTANT IN HOME DEM. WORK.

O. B. MARTIN,

ASSISTANT IN CHARGE DEM. CLUB WORK.

Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH.
FARMERS' COOPERATIVE DEMONSTRATION WORK.
Washington, D. C.

GROWING TOMATOES, BEANS AND OKRA IN THE CLUB GARDEN.

TO CANNING CLUB MEMBERS:

Letter No. 543 gave the first instructions for gardening. We asked you to keep it and all subsequent letters, read them carefully and begin at once to keep a record of all work done. A daily record book, B-511-i, has been made for you to use throughout the season and will be sent by your county agent for the asking. Here is the second letter of this series. As before, we are indebted to Mr. H. C. Thompson of the Bureau of Plant Industry for the directions which follow:

PREPARATION OF THE SOIL FOR TOMATOES.

If the land was not plowed in the fall, plow as early in the spring as possible and prepare it thoroughly by harrowing and dragging. Where the land was plowed in the fall replot it in the spring - then apply the manure and thoroughly mix it with the soil by disking and harrowing. Harrow and disk the soil as many times as is necessary to put it in the very best of condition and use a drag or roller to break up the clods. Where the land is well drained, level culture should be practiced, but where the soil is poorly drained, the plants should be set on ridges. The flatter the ridges the better, provided good drainage is secured. Never use narrow peaked ridges as these dry out too quickly.

FERTILIZERS.

Even where manure is used, commercial fertilizer should be applied as the manure will not supply all the elements of plant food needed. For soil that is manured at the rate of 2 to 3 loads on the one-tenth acre plat, it is advisable to apply 10 to 20 pounds of nitrate of soda, 50 to 100 pounds of 16% acid phosphate and 15 to 30 pounds of muriate or sulphate of potash, to the plat. If no manure is used, add 40 to 80 pounds of cottonseed-meal in addition to the fertilizers already mentioned. Where the soil is well supplied with potash the amount of muriate or sulphate of potash could be reduced. On fairly rich soils use the smaller amounts suggested and on poorer soils use the larger amounts. The fertilizer can be applied broadcast or sown in the row. When distributed in the furrow, it should be well mixed with the soil by running a cultivator along the row. After being well mixed with the soil in furrow, the ridges should be thrown up over the rows and leveled off with a light drag.

SETTING THE PLANTS.

Before taking up the plants, the soil in which they are growing should be thoroughly soaked in order to make it adhere to the roots. Where the plants are grown in pots, cans, etc., the whole mass of soil should adhere to the plant when it is set out. If the plants are not grown in individual receptacles, as large a ball of soil as possible should be taken up with each plant.

The plants for the early crop should be set out as soon as all danger of frost is over. A good method to use in setting them is to open a furrow with a turn-plow and set them in this furrow. If the soil is dry, pour in about a pint of water around each plant. As soon as the water has soaked in, pull some dry soil around the plant.

The distance of planting depends on the method of culture. Where the plants are to be pruned to one or two stems and tied to stakes, make the rows 3 to 4 feet apart and set the plants 2 to 2½ feet apart in the row. If the plants are not to be trained to stakes, set them 3 to 4 feet apart in the row with the rows 4 feet apart.

CULTIVATION.

Cultivate the soil as often as necessary to keep the surface loose and free from weeds and grass. Frequent shallow cultivation should be followed at all times so that the moisture will be retained. Use a light cultivator rather than a shovel plow, sweep or turning plow. Some hand hoeing will be necessary to keep the weeds down and the soil loose around the plants and in the row. After every rain the soil should be cultivated to prevent baking and the subsequent loss of moisture.

TRAINING.

For the early crop of tomatoes for market, the plants should be trimmed to one or two stems and tied to stakes or other kind of supports. After selecting the one or two stems that are to bear the fruit, go over the plant about once a week and pinch out the shoots growing in the axils of the leaves (where the leaf joins the main stem). Keep the stems tied to the supports so they will not bend over or break. Use soft twine or strips of cloth for tying and do not draw it tight around the stem. Many growers in the south use stakes one inch or more square and about 5 feet long. These stakes are driven in the ground near the plant, about a foot or a foot and a half deep. By pruning and tying in the way mentioned, the plants can be more easily and thoroughly sprayed, better cultivation can be given, and the fruit will ripen earlier and be more uniform in size and shape. The fruit will be kept off the ground and can be more easily harvested. For canning purpose, where earliness is not of great importance, it is a question whether pruning and staking will pay, because as much or more fruit will be produced without the training.

HARVESTING.

Tomatoes for a local market should be well-colored and firm when picked but for a distant market they must be harvested before they become well-colored. For market, tomatoes should be put up in neat, attractive packages, pre-

ferably in half-peck baskets which can be shipped in crates of 4 or 6 baskets. The more uniform the fruit is in size, shape, and color, the higher the price received on the market. All deformed, cracked, or decayed tomatoes should be thrown out as such fruits will injure the sale of the first-class fruit. The tomatoes should be placed in the baskets in such a way that they will present the best appearance and will not shake about in the package. Do not put large and small fruit in the same package. For a very fancy trade, tomatoes are often wrapped in tissue paper before being placed in the basket.

For canning, the tomatoes should be full-ripe but not soft. Unripe fruit gives a straw-colored product when canned and over-ripe fruit makes a "mushy" product.

BEANS AND OKRA.

For growing beans and okra, the same general directions of preparation of soil, fertilization and cultivation as given for the tomato will be satisfactory. The seed of these two crops may be planted as soon as the soil has begun to warm up and all danger of frost is over. For a continuous supply of these vegetables, successive plantings, four or five weeks apart, should be made.

OKRA.

Plant seed 3 or 4 inches apart in rows $3\frac{1}{2}$ to 4 feet apart and cover to the depth of 1 to 2 inches according to the soil - the lighter the soil the deeper the seed should be planted. As soon as the plants are well established, thin to 12 to 14 inches apart for dwarf varieties and 18 to 24 inches for the large growing varieties.

The pods should be gathered when they are tender and this will ordinarily require picking every day. The varieties most commonly grown are the Tall green long pod, Tall green short pod, Dwarf green long pod, Dwarf green short pod, and the Lady Finger.

BEAN.

Plant the seed 2 to 4 inches apart in rows $2\frac{1}{2}$ to 3 feet apart and cover $1\frac{1}{2}$ to 2 inches deep. There are two types of bush beans grown in the gardens in this country - the wax and the green pod. The green pod is the better type for canning. The Stringless Green Pod and the Refugee are the best canning varieties.

The girls who do not wish to plant the entire tenth acre in tomatoes may have two or three other varieties of vegetables in addition to tomatoes. We suggest string beans and okra because these vegetables can be canned to advantage, the okra being combined with tomatoes in soup mixture.

Sincerely yours,

MARY E. CRESWELL,

ASSISTANT IN HOME DEMONSTRATION WORK

O. B. MARTIN,

ASSISTANT IN CHARGE DEMONSTRATION CLUB WORK.

July 5, 1917.

Form No. A-89.

COOPERATIVE EXTENSION WORK IN AGRICULTURE
AND HOME ECONOMICS.

U. S. Department of Agriculture
and State Agricultural Colleges
cooperating

States Relations Service,
Office of Extension Work, South.
Farmers' Cooperative Dem. Work.
Washington, D. C.

JELLY AND JELLY MAKING.

These instructions have been prepared by Dr. M. N. Straughn, of the Carbohydrate Laboratory, Bureau of Chemistry, for use by Home Demonstration agents and advanced club members.

What is Jelly? Jelly is the sound, semisolid, gelatinous product made by boiling clean, sound, properly matured and prepared fresh fruit with potable water, concentrating the expressed and strained juice, to which sugar (sucrose) is added, and conforms in name to the fruit used in its preparation.

A jelly is composed of pectin, acid, sugar, ash and fruit flavors, the latter depending on the fruit used. Not all fruits will make a jelly; some lack acid, as an example, the pear, while others have acid but no pectin, the cherry and pineapple illustrating this class. Other fruits, such as apple, crabapple, gooseberry, quince, raspberry, blackberry, grape, currant, guava, kumquat, orange, etc., contain both acid and pectin in sufficient amounts to form a jelly with the addition of sufficient sugar and proper boiling.

The finished jelly should be clear, having the natural color of fruit from which made, free from crystals and of such a consistency that it will not "weep". When removed from the container it should retain its shape and have a texture such that it will quiver yet not break and when cut, even though at an angle of 90°, it will retain the angle and appear glistening.

Making Jelly.

In selecting fruit for making jelly, sound, ripe fruit should be chosen and the jelly made as soon after picking the fruit as possible, as fruits lose their flavor upon standing and there is a gradual breaking down of the pectins, thereby lowering their jellifying power. With some fruits a better product is obtained where a portion of unripe fruit is used with the ripe; blackberry, raspberry, currant and grape being in this class. The portion of unripe fruit used will furnish the necessary pectin while the ripe fruit gives the desired color and flavor. Care must be taken that too large a proportion of green fruit be avoided since there is danger of an off flavor due to the tannins and bitter principles.

Preparation. It is better to wash or rinse the fruit with water to remove dirt. In case the fruits have been sprayed to prevent their de-

struction by insects, scale, etc., the washing is very desirable. Small fruits and berries should be washed in running water before being stemmed or capped to avoid the loss of flavor and color. Grapes, currants, raspberries and blackberries should be stemmed or capped as sometimes a noticeable bitter flavor results from leaving the stems on when boiling the fruit. Those berries, etc., should be mashed and water added before the cooking is begun. Allow $\frac{1}{4}$ pint water for each pound of fruit. In the case of apples, crab-apples and guavas, cut or slice into small pieces, add $1\frac{1}{2}$ pounds or parts of water for each pound or part of fruit taken.

Extracting Pectin. Heat to boiling and allow to simmer for $\frac{1}{2}$ to $\frac{3}{4}$ hour. This will depend upon the fruit taken, some varieties being firm and hard requiring a longer time to cook. When the pieces of fruit are very tender it is time to remove from the fire. The jelly will not be so clear if the fruit is cooked until it has become thoroughly soft.

Straining the Fruit Juice. After cooking, the fruit should be placed in a cotton bag, pressed to remove all the juice and this juice should then be allowed to drain through a closely woven flannel bag (no pressure being applied).

Addition of Sugar. Here one of the two most difficult things to decide in jelly making arises: How much sugar shall be added to a given quantity of juice? By the use of alcohol an idea can be formed of the amount of sugar to add to the strained juice. To a tablespoonful of cold fruit juice add an equal volume of grain alcohol (95%) and mix by shaking gently. Pour into a spoon and if the pectin is precipitated and has gathered in a lump, it is safe to add a pound of sugar for each pound of juice. If there is a heavy precipitate of pectin but it has not gathered into one lump then the sugar must be added in less proportion to the juice.

In making jelly from apples, a very safe way of determining the proportion of sugar to juice has been devised. A table has been constructed showing the amount of sugar to add to a volume of juice, depending on the density of the juice. Although this is not absolutely accurate, a better product is obtained in most cases where this table is followed than where the amount of sugar to add is decided by looking at or feeling the juice. This scheme has been used in one of the large factories and has given a very uniform product. The density of the juice is obtained by the use of a spindle. The spindle used for this table is known as a "Erix Spindle" or hydrometer. The juice, after having drained through the bag, is cooled to room temperature. A cylinder is filled with the juice, the temperature of the juice and the reading of the spindle is taken. From the table the amount of sugar to add to a given quantity of the juice is obtained.

If the temperature of the juice is $20^{\circ}\text{C}.$, no correction need be made. If the temperature of the juice reads $25^{\circ}\text{C}.$, add .5 to the Brix reading. If the temperature is $30^{\circ}\text{C}.$, add .8 to the Brix reading, this being the corrected Brix figure.

Total for 2-1/2 gallons of Apple Juice.

Corrected Brix*	Sugar lbs. oz.	Corrected Brix*	Sugar lbs. oz.	Corrected Brix*	Sugar lbs. oz.
7.0	7 12	8.0	8 14	9.0	10 00
7.1	7 14	8.1	9 00	9.1	10 02
7.2	8 00	8.2	9 02	9.2	10 04
7.3	8 02	8.3	9 04	9.3	10 06
7.4	8 04	8.4	9 05	9.4	10 07
7.5	8 05	8.5	9 07	9.5	10 08
7.6	8 07	8.6	9 09	9.6	10 10
7.7	8 09	8.7	9 10	9.7	10 12
7.8	8 11	8.8	9 12	9.8	10 14
7.9	8 12	8.9	9 14	9.9	10 15
				10.0	11 01

*degrees

Quantity of Juice to Cook. The quantity of juice to be cooked at one time will depend upon the size of the vessel in which the juice is to be cooked and upon the means at hand for heating this juice. The capacity of the vessel used should be four times as great as the volume of the juice to be cooked, and the quantity of juice to be cooked at one time will depend upon what means of heating is available, that is, gas, oil, wood, or coal. If the attempt is made to cook a large quantity of juice at one time over a low flame a destruction of the pectin is likely to occur, thereby decreasing the yield, and there will be a loss of color.

When to Add the Sugar. When the juice begins to boil add the sugar immediately. If the juice is boiling when the sugar is added solution is more rapid. Stir until the sugar is dissolved. By adding the sugar when the juice begins to boil more time is given for the inversion of the sucrose by the acids of the fruit and there is less danger from crystallization where a part of the sugars are present as invert sugar.

Cooking. After the addition of sugar the cooking should be as rapid as possible, to avoid destruction of pectin, which would cause the finished jelly to be less firm. Long cooking will tend to darken the product. If the sugar is heated before being added to the boiling juice, the temperature of the juice is not lowered so much, but as there is not an appreciable difference in time of cooking, whether the sugar is added hot or cold, it does not seem worth the energy spent in heating the sugar. Cane sugar, beet sugar, - granulated, powdered or lump - all give the same finished product.

Use of the Thermometer. If there is such a quantity of juice that several batches must be cooked, the thermometer can be used to great advantage. By noting the temperature at which the first batch was finished, it is an easy matter to duplicate this batch in texture or to make the next jelly more or less firm, as desired, by finishing the boiling at a higher or lower temperature. The temperature at which a jelly is finished varies not only with the fruit but the quantity of sugar that is added to the juice. As the proportion of sugar to juice is increased, so must the temperature to which the jelly is cooked be increased. A chemical thermometer reading in degrees Cen-

tigrade from 0 to 110° and having a stem 12-14 inches long is extremely useful in jelly making as the jelly point is never reached before a temperature of 104½° C. is shown on the thermometer.

Finishing Jelly. In using a thermometer for cooking apple jelly, it has been noted that the temperature is seldom less than 105° C. or more than 106° C. while the temperature for guava jelly is approximately 108° C. A temperature less than this will give a soft sirupy product. With grape and currant jelly between 106° C. and 107° C. will give the best results.

Since no definite temperatures can be given for cooking jellies, the most convenient means of determining when it is finished is to dip a spoon or paddle in the boiling mass, remove it and allow the jelly to drop from it. As long as there is sirup present it will run or drop from the spoon; when the jelling point is reached, it will break from the spoon in flakes or sheets. When this jelly stage is reached, remove from the fire and skim. Skimming the jelly at this point causes less waste. Pour at once into hot sterilized glasses which have not been dried, and set aside to cool.

Sealing the Jelly. When the jellies are cold, cover with hot melted paraffin. By running a pointed stick around the edge of the glass while the paraffin is still hot a better seal is obtained.

Storing Jelly. Jelly should be stored in a cool, dark, dry place. If jelly is stored for a long period of time, it will deteriorate in texture, color and flavor.

MISTAKES TO AVOID.

A jelly is judged a failure because its consistancy is such that it will flow as a sirup, when poured from its mold, or when it is tough and stringy, when crystals occur throughout the jelly, or when it has soured. Souring is sometimes caused by not having cooked the jelly sufficiently to drive off the excess of water. The formation of mold on the jelly denotes carelessness in the handling. This is usually due to setting the jelly aside to cool in closets which are infested with mold spores, or to using glasses and tin covers without proper sterilization.

Jellies are soft and runny because more sugar has been used than the fruit juice required or because the boiling, after the addition of sugar, was not continued for a sufficient length of time to drive off the excess of water.

Tough jelly results when too small an amount of sugar is used for the quantity of fruit juice taken, or when the boiling is continued after the jelling point has been reached.

Crystals appear throughout the jelly because of an excess of sugar. In boiling some sirup spatters on the side of the vessel, dries and when pouring the finished product these crystals are carried into the glasses of jelly and in that way the jelly becomes seeded with crystals of sucrose. Another reason for crystals forming in the jelly is that sufficient inversion of the sucrose

has not taken place. This is due to boiling the juice to too great concentration before the addition of sugar.

Cloudy Jelly may be due to having cooked the fruit too long before straining off the juice or to not using sufficient care in straining it. Sometimes it is noticed in apple or crabapple jelly that although the jelly is clear when first made, it becomes cloudy after a time. In these cases it is usually due to the use of partly green fruit, the starch in this fruit probably causing the cloudy appearance.

RECIPES.

Apple Jelly. 1 lb. fruit) Boil together for $\frac{1}{2}$ to $\frac{3}{4}$ hour and
 2 lb. water) strain.

One pint strained juice - determine amount of sugar to be added by the use of the alcohol test, previously given - bring the juice to a boil, add the sugar and cook as rapidly as possible until the jelly point is reached. Remove from the fire, skim, pour into hot sterilized glasses and when cold cover with melted paraffin.

Grape Jelly. 4 lbs. grapes) Crush and boil together for 20 minutes,
 1 lb. water) press through a jelly bag and allow to
) drain through a flannel bag.

Test the strained juice with alcohol to determine the proportion of sugar to use. Bring the grape juice to boiling, add sugar, and stir until the sugar is dissolved. Continue the boiling until the jelly point is reached and finish as for apple jelly.

Blackberry Jelly. 4 lbs. blackberries
 1 lb. water

Select 3 pounds of ripe and 1 pound of under-ripe fruit, wash by running water over them, cap, crush and add 1 pint of water and boil 15 minutes. Press the pomace and strain the juice through a flannel bag. Determine the correct amount of sugar to be added by the use of the alcohol test. Bring the juice to a boil, add sugar, and stir until the sugar is dissolved. Continue the boiling until the jelly point is reached. Finish as for apple jelly.

USE OF PECTIN.

Jellies having the flavor of strawberry, pineapple, cherry or peach can be made by combining the juice of these fruits with pectin obtained from other sources, such as apple, crabapple or white portion of orange peel or pomace from cider presses or the skins and cores of apples which have been used in canning. When overripe blackberries, raspberries, currants or grapes are used for making jelly, the addition of pectin from the above sources can be used advantageously.

Apple Pectin. 1 lb. apple pomace or
(skins and cores)

Juice of 1 lemon
4 pounds water.

Only sound fruit should be used, not decomposed or wormeaten fruit.

Boil for $\frac{1}{2}$ to $\frac{3}{4}$ hour. press the juice through a cloth bag, then allow this juice to drain without pressure through a heavy flannel or haircloth jelly bag. This juice when cold should be tested with alcohol to determine the proportion of sugar to add to a volume of juice. Pectin, whether obtained from orange peel or apple, can be bottled, sterilized and kept until needed for jelly making. Process pint jars for 15 minutes in a water bath. Tighten the covers or stoppers and set aside until needed.

Orange Pectin. Cut or scrape the yellow from the peel of the orange; the white portion remaining is passed through the food chopper and weighed. For each pound of this prepared peel add 2 pounds of water and 4 tablespoonfuls of lemon juice, mix thoroughly and allow to stand 15 minutes. Then add 2 pounds water, boil 10 minutes, let stand over night, boil 10 minutes, allow to cool, place in jelly bag, press to remove juice, strain juice thoroughly, clean jelly bag and test the juice when cold with alcohol to determine the proper amount of sugar to be added.

Mint and Orange (or Apple) Pectin Jelly.

- 1 pt. concentrated orange (or apple) pectin juice
- 1 lb. sugar
- 2 drops oil of peppermint
- 2 drops green vegetable coloring

Put one pint of orange (or apple) pectin juice into a kettle, heat to boiling, and add the sugar. Continue boiling until the jelling point is reached. At this point add 2 drops of green vegetable coloring matter together with 2 drops of oil of peppermint. Stir thoroughly, and pour while hot into clean, sterilized jelly glasses. After a few moments, the scum which rises to the top may be easily removed from the jelly with a spoon. Complete jelly as previously directed.

Strawberry and Orange(or apple) Pectin Jelly.

- $\frac{1}{2}$ pt. concentrated orange (or apple) pectin
- $\frac{1}{2}$ lb. sugar
- $\frac{1}{2}$ pt. strawberry juice

Add one-half pint orange (or apple) pectin juice to one-half pint strawberry juice. Bring to a boil, add the sugar and continue boiling until the jelling point is reached. Pour immediately into hot sterilized jelly glasses, skim, and when cold pour hot paraffin over the jelly.

Pineapple and Orange (or Apple) Pectin Jelly.

Add one-half pint of orange (or apple) pectin juice to one-half pint of pineapple juice which has been boiled for 10 minutes. Boil, add one-half pound of sugar and continue boiling until the jelling point is reached. Pour into hot sterilized jelly glasses and when cold, pour hot paraffin over the jelly.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

OFFICE OF FARMERS' COOPERATIVE DEMON-
STRATIONS, NORTHERN AND WESTERN STATES,
WASHINGTON, D. C.

CANNING WINDFALL AND CULL APPLES AND USE OF BY-PRODUCTS.

To be able to transform the windfall and cull apples into a valuable and palatable food product, available for home consumption throughout the entire year as well as for the commercial market, is a great advantage worth the consideration of all apple growers. This circular does not discuss the use of such apples for making apple sauce, cider, cider vinegar, apple jelly, apple preserves, apple butters, and similar products, but deals with some new recipes for using windfalls and culls profitably; as, canning the apples whole, sliced for pie filling, and quartered for fruit salads; the sterilization of cider so as to keep it sweet and unfermented throughout the year; and a method for making apple sirup. The recipe for this sirup was furnished by Mr. H. C. Gore, of the Bureau of Chemistry.

The windfall and cull apples may be divided into two grades. The first grade would include the whole, reasonably sound, fruit; the second grade, the worm-eaten, partially decayed, and injured fruit. Do not can any injured or decayed part nor allow apples to become overripe before canning.

RECIPE FOR CANNING WHOLE, REASONABLY FIRM, APPLES.

Wash apples. Remove core and blemishes. Place whole apples in blanching tray or blanching cloth, and blanch in boiling hot water for two minutes. Remove and plunge quickly into cold water. Pack in large, empty glass jars or gallon tin cans. Pour over the product a hot thin sirup of about 18° density. Place rubber and top in position. Seal partially, not tight. (If using tin cans, cap and tip completely.) Process half-gallon or gallon containers 20 minutes in boiling hot water, in homemade or hot-water bath outfit; 15 minutes in water-seal; 10 minutes in steam-pressure outfit, with 5 pounds of steam pressure; 5 minutes in aluminum pressure-cooker outfit, under 15 pounds of steam pressure. Remove jars, tighten covers, invert to cool, and test joints. Wrap in paper, and store. The time of heating will have to be varied according to ripeness and condition of the fruit. Use just enough time to sterilize perfectly, and yet not enough to change the color or reduce the pulp to sauce.

Firm and tart apples may be cored and peeled first, then canned by the above recipe.

USES FOR CANNED APPLES.

- (1) Breakfast dish, with cream and sugar added.
- (2) Baked, like fresh apples for breakfast or for other meals.
- (3) Apple salad, often served for lunch or supper.
- (4) A relish with roast pork. The apples may be fried in the pork fat or the cores may be cooked with roast pork for flavoring.
- (5) Apple dumplings, deep apple pie, and other desserts in which whole apples are desirable.
- (6) The sirup of canned whole apples can be used for pudding sauces or fruit drinks.

RECIPE FOR CANNING APPLES FOR PIE FILLING.

Use second grade of windfalls or culls. Wash, core, pare, and remove all decayed or injured spots. Slice apple quickly into a basin containing slightly salted cold water (about 1 teaspoonful per gallon), to keep from discoloring. Pack fresh cold product in glass jars or tin cans. Add one cupful of hot, thin sirup of about 18° density to each quart of fruit. If using glass cans, put on the rubbers, and screw on the tops, but do not seal completely. If using tin cans, cap and tip, sealing up completely. Sterilize 12 minutes in hot-water bath, homemade outfit; 10 minutes in water-seal outfit; 6 minutes under 5 pounds of steam pressure; 4 minutes in aluminum pressure cooker. Remove jars, tighten covers, invert to cool, and test joint. Wrap in paper, and store.

NOTE.—This filling can be used for making apple pies in the same way that fresh apples would be used, with the exception that the sirup must be poured off, and less sugar should be used. Since the apples have already been cooked, only enough heat is needed to cook the crust and to warm the apples through. Pies may be baked in 7 minutes. The apple pies made with these apples are, in the opinion of many housekeepers, as good as those made with fresh fruit, and they can be made in less time and are less expensive.

RECIPE FOR CANNING QUARTERED APPLES FOR FRUIT SALADS.

Select best grade of culls of firm and rather tart varieties. Core, pare, and quarter. Drop into a basin containing slightly salted cold water. Pack these quartered pieces tightly in jar or tin container. Add a teacupful of thin, hot sirup to each quart. Place rubber and top in position, partially seal, not tight. Cap and tip completely tin cans. Sterilize 12 minutes in hot-water bath, homemade outfit; 10 minutes in water-seal outfit; 6 minutes under 5 pounds of steam pressure; 4 minutes in aluminum pressure cooker. Remove jars, tighten covers, invert to cool, and test joint. Wrap in paper, and store.

KEEPING APPLE CIDER SWEET BY THE HOME-CANNING METHOD.

Fill fruit jars with the fresh apple cider. Add a tablespoonful of sugar to each quart. Place rubber and cap in position, partially tighten, or cap and tip the tin cans. Sterilize in hot-water bath outfit for 10 minutes; in water-seal outfit for 8 minutes; in the steam-pressure outfit, under 5 pounds of steam, for 4 minutes; in the aluminum pressure cooker for 2 minutes. Remove jars, tighten cover, invert to cool, and test joint.

NOTE.—If you desire the apple cider to be a little tart or slightly fermented, it will be necessary to let it stand for two or three days before you sterilize, and then add about two minutes of time to each schedule given in the recipe.

REDUCING SWEET APPLE CIDER TO SIRUP.

It may not be practical for the average fruit farmer to make apple sirup as a commercial proposition, but during seasons when there are a large number of culls and windfalls, when markets are glutted, and no profitable market for apples, it is a matter of business economy to utilize by-products and the making of apple sirup for the family's winter use is quite worth while.

NOTE.—Wash apples, remove all decayed and worm-eaten spots, and press out juice as usual for cider making. Be sure the juice does not ferment or "work" as only sweet cider should be used for sirup making. The sterilizing, reducing vat, or kettle, should be a third larger than required to hold contents.

RECIPE FOR APPLE SIRUP.

Add 5 ounces of powdered calcium carbonate to 14 gallons of apple cider. Powdered calcium carbonate (carbonate of lime), or, to give it its common name, precipitated chalk, is a low-priced, harmless chemical available at any drug store. Boil in kettle or vat vigorously for a period of five minutes. Pour the liquid into vessels, preferably glass jars or pitchers, allow to stand six to eight hours, or until perfectly clear. Pour the clear liquid into preserving kettle. Do not allow sediment at bottom to enter. Add to the clear liquid one level teaspoonful of lime carbonate and stir thoroughly. The process is completed by boiling down rapidly to a clear liquid. Use density gauge or candy thermometer and bring it up to 220° F., or, without thermometer, reduce bulk to one-seventh of original volume. To see whether it is cooked enough, test as you would sirup or candy, by pouring a little of it into cold water. If boiled enough, it should have the consistency of maple sugar. It should not be cooked long enough to harden like candy when tested. When the test shows that the sirup has been cooked enough, pour it into fruit jars, pitchers, etc., and allow it to cool slowly. Slow cooling is important, as otherwise the suspended matter will not settle properly and the sirup will be cloudy. A good way to insure slow cooling is to stand the vessels full of sirup in a bucket or a wash boiler of hot water. They may also be placed in a fireless cooker. The white sediment which settles out during cooling is called "malate of lime" and is a harmless compound of lime with the natural acid of the apple. When the sirup is cooled, it should be stored in fruit jars or bottles. Place the rubber cap or cork in position and tighten. Then place the bottles or cans of sirup in hot water and sterilize for 12 minutes in hot-water or wash-boiler outfit, 10 minutes in water-seal outfit, 8 minutes in steam-pressure outfit under 5 pounds of steam, or 5 minutes in aluminum pressure cooker under 15 pounds of pressure.

Apple sirup made by this method is a very palatable and high-grade product. It has a flavor much like the thick sirup or jelly which is so often formed when apples are baked with a little sugar. As shown by experiments made by the Government experts, this apple sirup can be used in cooking with good results, as well as for table purposes.

The recipes given herewith show the time requirements for the four different types of canning outfits, but this does not mean that the fruit or cider must be subjected to all four processes in four different types of outfits. Only one should be used. The four time requirements are given so that the one using the recipes will have complete instructions to follow, regardless of the type of outfit available for the work.

O. H. BENSON,
In Charge of Club Work,
Northern and Western States.

Approved:

C. B. SMITH,

In Charge of Office of Farmers' Cooperative Demonstrations,
Northern and Western States.

Form NR-23

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

SUGGESTIONS AND INFORMATION FOR CANNING DEMONSTRATORS.

SUGGESTIONS No. 4.

1. In taking up the work of canning clubs follow but one set of instructions. If you use sets from different sources you will have trouble.

2. No child or amateur should be started on the canning of soups or meats the first season. Canning-club members should be taught to can the simple, inexpensive products of the orchard and garden which would otherwise go to waste.

3. Do not use imported fruits and vegetables in demonstrations if it is possible to secure cheap, inexpensive products grown in the community. To teach the canning of pineapples and bananas in the Northern and Western States and neglect the canning of beans, peas, and tomatoes is a serious mistake, as much out of place as teaching the use of finger bowls before teaching the use of knives, forks, and napkins.

4. The United States Department of Agriculture has not published standards of weights required in the case of canned fruits and vegetables offered for sale in glass jars and cans. The rule is to fill the cans as full as possible with fruit or vegetables before adding the liquid. However, the weight should always be stated.

5. Become familiar with the requirements of the Federal Food and Drugs Act of June 30, 1906, as amended, especially the requirements in regard to the statement of net weight or measure, and the State laws covering grade, weight, labels, and trade-marks of all canned goods. Canned goods prepared for sale within a State are governed by the State regulations. Canned goods prepared for interstate shipment come under the requirements of the Federal Food and Drugs Act as well as State regulations.

6. The live steam generated in a steam canner can be successfully used for scalding products such as peaches and tomatoes and for blanching products like beans, peas, sweet potatoes, and greens.

7. When asked or told about the importance of the exhaust period in canning in tin, explain that this is rendered unnecessary by blanching, cold dipping, filling the cans with boiling water or boiling sirup, and capping and tipping immediately. Explain further that exhausting increases the labor, may cause the can to collapse and take on a battered appearance, and does not cause the product to keep any better.

8. If cans bulge at both ends after they have been completely cooled, it indicates that the product has spoiled.

9. In giving instruction in the use of glass jars begin by teaching people to use those already on their shelves. After having made it clear that it is possible to use all types of containers,

suggest other successful types (not makes) and teach the methods of testing. Make sure that the importance of good rubbers is appreciated.

10. Avoid the appearance of advertising any kind of equipment. The work of the club leader and demonstrator is to use a canner to represent a type. It is always well to have samples of several different types on the platform during the demonstration. Efficient labor-saving devices for home canning are important to the work and should be encouraged, but representatives selling canning equipment should be discouraged from attending demonstrations given by club leaders.

11. In presenting the canning as a demonstration it is not always to the best advantage of the demonstration to meet the wishes of the community. A community that desires in one demonstration the canning of everything from strawberries to fish is asking too much. Be guided by what you know is best. It is never advisable to give a "dummy" demonstration where equipment is used but no products are actually canned.

12. When you find you have been placed on a program for a 30-minute canning demonstration it is advisable to give a club canning talk instead. A canning demonstration completed in 30 minutes injures the reputation of the demonstrator and is not helpful to the work.

13. Two types of canning demonstrations should be recognized—one for club members and one for the training of teachers and leaders. Parents and other interested adults should be invited to demonstrations when practicable. In canning demonstrations for club members the progress should be slow and the demonstration very thorough. A single homemade hot-water-bath outfit should be used in such a demonstration. When presenting the canning work to club leaders and adult housekeepers the progress should be more rapid and types of outfits discussed.

14. Avoid prolonged discussions on the scientific side of canning. If necessary, invite the party to meet you in conference after the demonstration. Do not permit one argumentative person to delay or interfere with the success of the demonstration.

15. A well-laundered costume, suitable table cover, and carefully selected and well-arranged equipment make for an efficient demonstration, but a clutter of jars, canners, pans, kettles, and other labor-saving devices confuses the club members and leaders and lessens the value of the demonstration.

16. Whenever possible it is advisable to leave in the community the fruit and vegetables canned in the demonstration. When it is not possible to completely sterilize a jar or to re-sterilize one on which the top or rubber is defective, be sure that the top and rubber are removed at the close of the demonstration so that defective jars may not be confused with the perfect packs canned by the demonstrator.

17. Suggestions and instruction to local committees in charge of arrangements for home-canning demonstrations similar to Form NR-52 will aid in securing proper preparations for the demonstrations.

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Approved.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

HOME CANNING CLUB INSTRUCTION—CANNING OF SOUPS.

By GEORGE E. FARRELL,
Assistant in Boys' and Girls' Agricultural Club Work.

After learning how to can fruits and vegetables successfully, the next logical step is to transform meat scraps, bones, ligaments, and odds and ends of vegetables and cereals into an economical as well as very palatable product for the home—something that can in a few moments' time be prepared and made ready for use as a hot dish for the winter months.

The canning of vegetable soups, purees, and consommés is thoroughly practical and should be a part of the canning work of every Home Canning Club member. It will be a delight to the club members to be able to reach to a shelf for a home-canned pack of soup, open it, heat it, and serve within a few minutes' time.

We are accused of being a wasteful people, wasting much of the products of garden and farm. The bones that are often discarded when meat is being packed for winter use contain valuable food. Let us develop through soup making and soup canning, habits of economy and education in thrift. The bones from beef and chicken are by far the most common, though others can be used.

Every club member should know how to can these soups. The following instructions, as an additional and advance series, can be followed by club members in this work. All of the Home Garden and Canning Club members who have been members for two years should, in addition to their other canning work, take up the canning of soups. File these instructions with the others of the NR Series from the United States Department of Agriculture which you have received as follow-up instructions in home canning.

CANNING RECIPES.

SOUP STOCK.

Secure 25 pounds of beef hocks, joints, and bones containing marrow. Strip off the fat and meat and crack bones with a hatchet or cleaver. Put the broken bones in a thin cloth sack and place them in a large kettle containing 5 gallons of cold water. Simmer (do not boil) for 6 or 7 hours. Do not salt while simmering. Skim off all fat. This should make about 5 gallons of stock. Pack hot in glass jars, bottles, or enamel or lacquered tin cans. Partially seal glass jars. (Cap and tip tin cans.) Sterilize 40 minutes if using a hot-water bath outfit; 30 minutes if using a water-seal or a 5-pound steam-pressure outfit; 25 minutes if using a pressure-cooker outfit.

Check list of supplies to be provided before beginning work.

25 lb. of beef bones.
5 gal. water.

VEGETABLE SOUP.

Soak $\frac{1}{4}$ lb. lima beans and 1 lb. rice for 12 hours. Cook $\frac{1}{2}$ lb. pearl barley for 2 hours. Blanch 1 lb. carrots, 1 lb. onions, 1 medium-sized potato, and 1 red pepper for 3 minutes and

cold dip. Prepare the vegetables and cut into small cubes. Mix thoroughly lima beans, rice, barley, carrots, onions, potatoes, red pepper. Fill glass jars or the enameled tin cans three-fourths full of the above mixture of vegetables and cereals. Make a smooth paste of $\frac{1}{2}$ lb. of wheat flour and blend in 5 gal. of soup stock. Boil 3 minutes and add 4 oz. salt. Pour this stock over vegetables and fill cans. Partially seal glass jars. (Cap and tip tin cans.) Sterilize 90 minutes if using the hot-water bath outfit; 75 minutes if using a water-seal or a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list of necessary supplies.

$\frac{1}{2}$ lb. lima beans.	1 medium-sized potato.
1 lb. rice.	1 red pepper.
$\frac{1}{2}$ lb. pearl barley.	$\frac{1}{2}$ lb. flour.
1 lb. carrots.	4 oz. salt.
1 lb. onions.	5 gal. soup stock.

CREAM OF PEA SOUP.

Soak 8 lb. of dry peas overnight. Cook until soft. Mash fine. Add the mashed peas to $5\frac{1}{2}$ gal. of soup stock and bring to boil. Pass the boiling liquid through a fine sieve. Make a smooth paste of $\frac{1}{2}$ lb. flour and add paste, 10 oz. of sugar, and 3 oz. of salt to the soup stock. Cook until soup begins to thicken. Pack in glass jars or tin cans. Partially seal glass jars. (Cap and tip tin cans.) Process 90 minutes if using a hot-water bath outfit; 80 minutes if using a water-seal outfit; 70 minutes if using a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list.

$5\frac{1}{2}$ gal. soup stock.	10 oz. granulated sugar.
8 lb. dry peas.	$\frac{1}{2}$ lb. flour.
3 oz. salt.	

CREAM OF POTATO SOUP.

Boil $1\frac{1}{2}$ lb. of potatoes, sliced thin, and 5 gal. of soup stock for 10 minutes. Add 3 oz. of salt, $\frac{1}{4}$ teaspoonful of pepper, and $\frac{1}{2}$ lb. of butter, and boil slowly for 5 minutes. Make 3 tablespoonfuls of flour into smooth paste and add to the above. Cook 3 minutes and pack in glass jars or tin cans while hot. Partially seal glass jars. (Cap and tip tin cans.) Sterilize 90 minutes if using a hot-water bath outfit; 75 minutes if using a water-seal outfit; 65 minutes if using a 5-lb. steam-pressure outfit; 45 minutes if using a presser-cooker outfit.

Check list.

5 gal. soup stock.	$\frac{1}{4}$ tablespoonful pepper (scant).
$1\frac{1}{2}$ lb. thin sliced potatoes (culls will do).	$\frac{1}{2}$ lb. butter.
3 oz. salt.	3 tablespoonfuls flour.

BEAN SOUP.

Soak 3 lb. of beans 12 hours in cold water. Cut 2 lb. of ham meat into $\frac{1}{4}$ -inch cubes and place in a small sack. Place the beans, ham, and 4 gal. of water in a kettle and boil slowly until the beans are very soft. Remove the ham and beans from the liquor and mash the beans fine. Return the ham and mashed beans to the liquor and add 5 gal. of soup stock and seasoning, and bring to boil. Fill into glass jars and tin cans while hot. Partially seal glass jars. (Cap and tip tin cans.) Process two hours if using a hot-water bath outfit; 90 minutes if using a water-seal outfit; 75 minutes if using a 5-lb. steam-pressure outfit; 60 minutes if using a pressure-cooker outfit.

Check list.

5 gal. stock.	4 gal. water.
3 lb. beans.	Salt and pepper to taste.
2 lb. lean ham.	

OKRA SOUP.

Slice 8 lb. okra into thin disks. Blanch 10 minutes and cold dip. Boil 1½ lb. rice for 25 minutes. Mix the okra and rice and fill the cans or jars half full. To 5 gal. soup stock add 5 oz. salt, ¼ teaspoonful of coriander seed, and ¼ teaspoonful of powdered cloves, and bring to a boil. Fill the remaining portion of the jars or cans. Partially seal the glass jars. (Cap and tip tin cans.) Process 2 hours if using a hot-water bath outfit; 90 minutes if using a water-seal outfit; 75 minutes if using a 5-lb. steam-pressure outfit; 60 minutes if using a pressure-cooker outfit.

Check list.

5 gal. soup stock (see No. 1).	¼ teaspoonful powdered cloves.
8 lb. okra.	1½ lb. rice.
¼ teaspoonful coriander seed.	5 oz. salt.

TOMATO PULP FOR CREAM OF TOMATO SOUP.

Place tomatoes in a wire basket or piece of cheesecloth and plunge into boiling water from 1 to 3 minutes. Plunge into cold water. Remove the skin and core. Place tomatoes in a kettle and boil 30 minutes. Pass the tomato pulp through a sieve. Pack in glass jars and tin cans while hot, and add a level teaspoonful of salt per quart. Partially seal the glass jars. (Cap and tip tin cans.) Sterilize 20 minutes if using a hot-water bath outfit; 18 minutes if using a water-seal or a 5-lb. steam-pressure outfit; 15 minutes if using a pressure-cooker outfit.

CREAM OF TOMATO SOUP FROM CANNED TOMATO PULP.

Place 1 qt. of tomato pulp in a kettle. Add ½ teaspoonful of baking soda, pepper and salt to taste, 2 teaspoonfuls of granulated sugar. Boil for 7 minutes. Place 1 qt. of milk and 2 tablespoonfuls of butter in another kettle and simmer for 7 minutes. Add the contents of the tomato kettle to the contents of the milk kettle and boil for 5 minutes. The product is then ready to serve.

Check list.

1 qt. can tomato pulp.	1 qt. milk.
½ teaspoonful baking soda.	2 tablespoonfuls butter.
2 teaspoonfuls granulated sugar.	Salt and pepper to taste.

CHICKEN-SOUP STOCK.

Place 30 lb. chicken in 10 gal. of cold water and simmer for 5 hours. Remove meat and bones, then strain. Add sufficient water to make 10 gal. of stock. Fill glass jars or tin cans with the hot stock. Partially seal glass jars. (Cap and tip tin cans.) This stock is used to make soup where the term "chicken-soup stock" is employed. Process 90 minutes if using a hot-water bath outfit; 75 minutes if using a water-seal outfit; 60 minutes if using a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list.

30 lb. chicken.
10 gal. water.

CHICKEN BROTH WITH RICE.

For each gallon of soup stock use 12 oz. of rice. Boil the rice 30 minutes. Fill the jars or tin cans two-thirds full of rice and the remainder with soup stock. Partially seal glass jars. (Cap and tip tin cans.) Process 90 minutes if using a hot-water bath outfit; 75 minutes if using a water-seal outfit; 60 minutes if using a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list.

1 gal. chicken-soup stock.
12 oz. rice.

CHICKEN GUMBO.

Cut 2 lb. of ham into small cubes and boil 30 minutes. Mince 3 lb. chicken and chop $\frac{1}{2}$ lb. of onions fine. Make a smooth paste of $\frac{1}{2}$ lb. of flour. Add above to 5 gal. of chicken-soup stock. Then add $\frac{1}{2}$ lb. of butter and $\frac{1}{4}$ lb. of salt and boil 10 minutes. Then add 3 oz. of powdered okra mixed with 1 pint of water. Fill into glass jars or tin cans while hot. Partially seal glass jars. (Cap and tip tin cans.) Process 90 minutes if using a hot-water bath outfit; 75 minutes if using a water-seal outfit; 60 minutes if using a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list.

5 gal. chicken-soup stock.
3 lb. minced chicken.
2 lb. ham.
 $\frac{1}{2}$ lb. onions.

$\frac{1}{2}$ lb. butter.
 $\frac{1}{4}$ lb. salt.
 $\frac{1}{2}$ lb. flour.
3 oz. powdered okra.

VEGETABLES (MIXED) WITHOUT STOCK.

Many people would like vegetable soup during the winter season, but find it impracticable to secure the soup stock during the summer season when the vegetables are so abundant that they are rotting in the garden. It is suggested that the vegetable portion of the soup be canned during the summer and made available when the soup stock is prepared during the winter. It makes the preparation of the soup a simple matter whenever the stock is available.

Soak 6 lb. of lima beans and 4 lb. of dry peas over night. Boil each $\frac{1}{2}$ hour. Blanch 16 lb. of carrots, 6 lb. of cabbage, 3 lb. of celery, 6 lb. of turnips, 4 lb. of okra, 1 lb. of onions, and 4 lb. of parsley for 3 minutes and dip in cold water quickly. Prepare the vegetables and chop them into small cubes. Chop the onions and celery extra fine. Mix all of the vegetables together thoroughly and season to taste. Pack in glass jars or tin cans. Fill with boiling water. Partially seal glass jars. (Cap and tip tin cans.) Process 90 minutes if using a hot-water bath outfit; 60 minutes if using a water-seal outfit or a 5-lb. steam-pressure outfit; 45 minutes if using a pressure-cooker outfit.

Check list.

16 lb. carrots (small).
6 lb. cabbage.
3 lb. celery (stems and leaves).
6 lb. turnips.
6 lb. lima beans.

4 lb. okra.
1 lb. onions.
4 lb. parsley.
4 lb. dry peas.
Salt and pepper to taste.

NOTE.—These recipes are prepared for the canning of soup in the home and for home consumption. Those making soups from the recipes for sale within the State should consult the Food Commissioner of the State as to State food regulations. When these products are intended for sale in another State, or for interstate or foreign shipment, the canners should inform themselves concerning the requirements under the Federal Food and Drugs Act by consulting the Bureau of Chemistry, and, regarding meat-inspection regulations, the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

O. V. Benson

In Charge Boys' and Girls' Club Work, North and West.

Approved:

C. B. SMITH,

Chief, Office of Extension Work, North and West.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE
OF EXTENSION WORK, NORTH AND
WEST, WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

TINNING, CAPPING, AND SOLDERING CANS; REPAIR WORK FOR THE FARM AND HOME.

THE USE OF TIN CANS.

The use of tin cans is regarded as entirely practical for the home canning of surplus fruits and vegetables of the farm. Their use for this purpose is recommended because it simplifies the canning operation. The sealing of a tin can is a comparatively simple matter. It requires only a hand capping iron, a hand tipping copper, a little soldering flux, a small brush, some sal ammoniac, and a little practice. A self-heating hand capping iron which is kept constantly ready for use by means of an attached gasoline torch can now be secured if desired. (See fig. 1.) The use of tin cans for the canning of surplus fruit and vegetables has the further advantage that products so packed are easily handled in transportation and storage.

In the canning of green vegetables, meats, fish, rhubarb, berries, pumpkins, squash, beets, etc., however, the lacquered (enameled) cans should be used because these products may contain substances which dissolve the tin of the ordinary cans, and thus the food may be rendered harmful to health.

SIZE OF TIN CANS.

Several standard sizes of tin cans are in common use for canning purposes, as follows:

Number, size, and diameter of openings of tin cans.

No. of can.	Size of can.	Diameter of opening.
1.....	2 $\frac{5}{8}$ by 4 inches.....	2 $\frac{1}{8}$ inches.
2.....	3 $\frac{5}{8}$ by 4 $\frac{9}{8}$ inches.....	2 $\frac{1}{8}$ or 2 $\frac{7}{8}$ inches.
3.....	4 $\frac{1}{8}$ by 4 $\frac{7}{8}$ inches.....	2 $\frac{1}{8}$ or 2 $\frac{7}{8}$ inches.
10.....	6 $\frac{1}{8}$ by 6 $\frac{7}{8}$ inches.....	2 $\frac{1}{8}$ or 2 $\frac{7}{8}$ inches.

In buying cans it is always necessary to state whether you desire plain tin or lacquered (enameled) cans. In buying caps always ask for the solder-hemmed caps and give the diameter of the can opening. For whole fruits and vegetables cans with 2 $\frac{7}{8}$ -inch or even larger openings are preferable. Since the size of the can opening varies, and it will not ordinarily be advisable to have more than one capping iron, it is recommended that the larger size (2 $\frac{7}{8}$ -inch) capping iron be purchased.



FIG. 1.—A self-heating capping iron.

SOLDERING EQUIPMENT.

The soldering equipment required includes a capping iron, a tipping copper, soldering flux, a small brush, a porcelain, glass, or stoneware cup in which to keep the soldering flux, sal ammoniac, a few scraps of zinc, solder, a soft brick, and a file. If a hand-sealing machine and solderless cans are used, all other equipment and material are unnecessary.

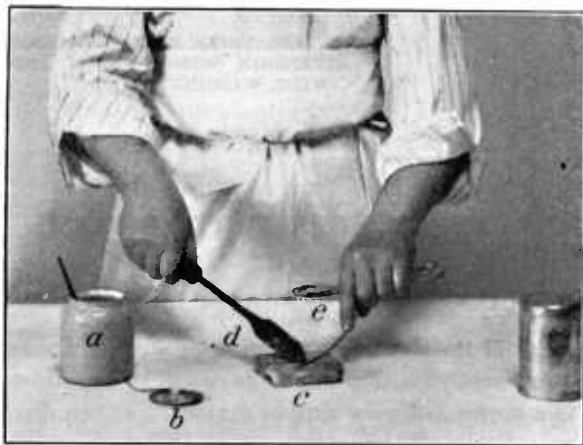


FIG. 2.—Tinning the tipping copper (or soldering iron): a, Flux jar and brush; b, solder-hemmed cap; c, bar sal ammoniac; d, tipping copper or soldering iron; e, wire solder.

SOLDERING FLUX.

Soldering flux is a solution of zinc in crude muriatic acid. It is used for cleaning the irons and for brushing the tin and solder surfaces so that the solder will adhere to the tin. It may be made as follows: Place 10 cents' worth of muriatic acid (purchased at the drug store) in a porcelain, stoneware, or glass jar and add as much sheet zinc in small pieces as the acid will dissolve; when the zinc has dissolved dilute the solution with a little water (about half-and-half) and strain through a piece of cloth or muslin. Flux is always best when it has stood at least 12 to 16 hours before being used. Keep the flux well mixed and free from dust and dirt. Care should be taken not to get the flux on clothing.

Soldering flux ready for use may be purchased at drug stores and hardware stores. Sometimes a powdered rosin is used as a substitute for the flux. Recently a soldering paste has been manufactured which is very desirable for use in canning work because it is convenient and clean to handle. It is sometimes called electricians' nonacid flux.

TINNING THE CAPPING IRON.

Clean the iron with a file or knife; heat it sufficiently to melt a little solder in the sal ammoniac (5 or 10 cents' worth purchased at the drug store); then place the iron in the mixture of sal ammoniac and solder and rotate it until the soldering edge of the iron is thoroughly covered with the solder.

TINNING THE TIPPING COPPER.

The tipping copper is tinned in very much the same way as the capping iron. Sometimes it is desirable, however, to file the tipping copper sufficiently to make it smooth and to correct the point. The copper should be filed to nearly a sharp point. All particles of smudge, burned materials, etc., should be removed from the iron before tinning. Heat the copper and rotate the tip of it in the mixture of sal ammoniac and solder until it has been covered with the melted solder and is as bright as silver. (See fig. 2.)

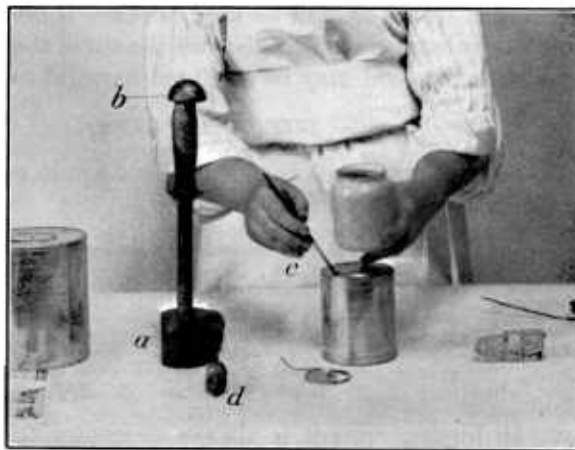


FIG. 3.—Applying the flux, the first step in soldering tin cans: a, Capping iron; b, head of inner upright steel; c, proper position of brush while stroking rim of cap with flux; d, tipping copper or soldering iron.

CAPPING A TIN CAN.

Learn to use one tin can for the training of all members of a canning club. By capping and tipping, heating the cap and throwing it off, and simply adding another cap to the same can, you can use this one can until you have trained all members of the class.

When capping the full packs, arrange the cans in rows upon the table while the capping and tipping irons are in the fire heating. Take a handful of solder-hemmed caps and place the caps on all cans ready to be capped. Place your finger on the venthole, hold the cap in place, and run the brush containing a small amount of flux around the solder-hemmed cap, evenly, with one stroke of the hand. Be careful not to get the flux inside of the can. Do this with all cans ready to be capped. (See fig. 3.) Then take the capping iron from the fire and insert the upright steel in the center. Hold the capping iron above the cap until the center rod touches the cap and holds it in place. (See fig. 4.) Then bring the cap down in contact with all four points of the solder-hemmed cap and rotate back and forth about three strokes. Do not bear down on the capping iron. A forward and backward rotation, if properly applied, will perfectly solder the cap in place. Remove the capping iron and inspect the joint. (See fig. 5.) If any pinholes are found, recap or repair with the tipping copper. It may be necessary to use a piece of wire solder or a waste solder rim from a cap to add more solder to the broken places or pinholes of a cap.



FIG. 4.—Position of capping iron and upright steel before lowering and sealing the rim.



FIG. 5.—Method of holding iron and position of hands for rotating the capping iron to strike all points of cap at same time.

TIPPING A TIN CAN.

With the flux jar and brush conveniently at hand, dip the brush in the flux and strike the venthole a side stroke lightly with the brush saturated with flux. Place the point of the wire solder over the venthole. Place upon this the point of the hot, bright, tipping copper. Press down with a rotary motion and remove quickly. (If a waste solder-hemmed cap rim is available, this may be used instead of the wire solder.)

With a little practice, a smooth perfect joint is easily made.

USE OF SOLDERING TOOLS FOR REPAIR WORK IN THE HOME.

By the use of the soldering flux, sal ammoniac, and tipping copper (or soldering iron) it is possible, in a few minutes, to solder the leaks in wash boilers, tin pans, milk pails, and other vessels of kitchen, creamery, etc. This will not only save time for the farmer and the housewife, but will oftentimes save considerable expense and worry.

To solder a leak in a tin or galvanized-iron bucket hold the bucket up to the light and locate the leak. Clean the surface to remove grease and dirt. Scrape to remove rust. Brush over the leak hole with soldering flux. Place the point of solder wire over the hole and apply the hot tipping copper. Rotate a trifle and remove. Sometimes it is desirable to do the soldering from the inside, and sometimes from the outside. In case the leak is a large one, the solder should be applied from both sides. (See fig. 6.)



FIG. 6.—Soldering a leak in a water pail. This shows how club members may make use of soldering tools in general repair work about the farm.

Other tin or galvanized-iron utensils and household articles may be repaired in a similar way.

If there are boys and girls in the family, it will be interesting to train them to do this repair work. It is a piece of manual-training work that should belong to their system of education. It does not require a trained mechanic or skilled machinist to solder and tip tin cans or to do the average repair work of the farm and the home.

LEGAL RESTRICTIONS UPON THE SALE OF CANNED PRODUCTS.

If the home-canned products are to be sold, certain legal restrictions which are placed upon the sale of canned goods must be observed. If they are to be sold wholly within

the State, information concerning the State food laws should be obtained by writing to the State board of health. If the products are to be shipped in interstate commerce, information should also be obtained concerning Federal laws and regulations by writing to the Bureau of Chemistry, United States Department of Agriculture, Washington, D. C. Products made and sold wholly within the District of Columbia or the Territories are also subject to the Federal Food and Drugs Act.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

HOME CANNING AND PRESERVING—ADDITIONAL RECIPES.

By GEORGE E. FARRELL, *Assistant in Boys' and Girls' Club Work in the Northern and Western States.*

[These recipes are part of the follow-up instruction in boys' and girls' club work. The complete series include Forms NR-21, NR-22, NR-23, NR-24, NR-25, NR-26, NR-29, and NR-30.]

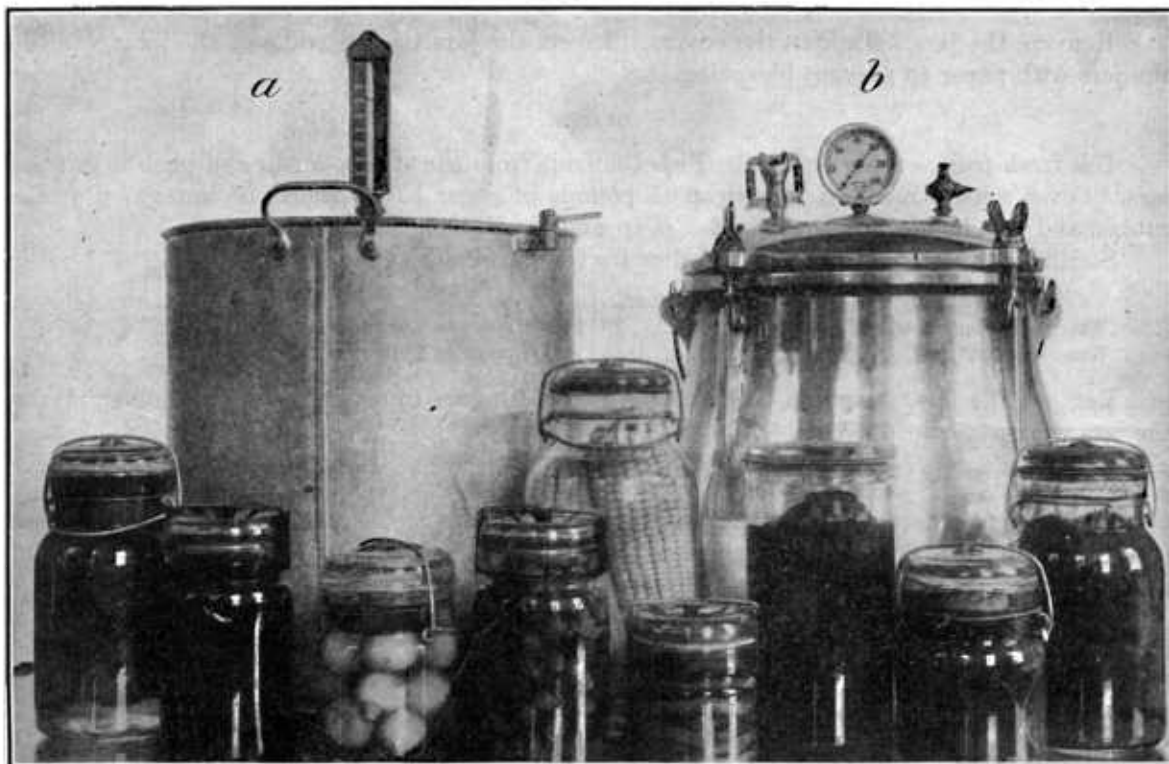


Fig. 1.—All types of jars and all types of canners may be used with these recipes and directions. (a) Water-seal canner; (b) pressure cooker.

SOFT FRUITS.

STRAWBERRIES.

Recipe 1.—Can fresh, sound berries the same day they are picked. Hull (twist berries off hull) and place in a strainer. Pour water over the berries to cleanse. Pack them in a jar without crushing. Pour hot sirup (2 pounds of sugar to 1 quart of water) over the berries to the top of the jar. Put the rubber and cap in position, not tight. (Cap and tip enameled tin cans completely.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	8	Steam pressure 5 pounds.....	6
Water seal at 214°.....	6	Steam pressure 15 pounds.....	4

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

Recipe 2.—Berries canned by this recipe will not rise to the top of the sirup. Use only fresh, ripe, firm, and sound berries. Prepare the berries. Add 8 ounces of sugar and 2 tablespoonfuls of water to each quart of berries. Boil slowly for 15 minutes in an enameled or acid-proof kettle. Allow the berries to cool and remain over night in the covered kettle. Pack the cold berries in sterilized glass jars. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	5	Steam pressure 5 pounds.....	4
Water seal 214°.....	5	Steam pressure 15 pounds.....	4

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

GRAPES.

Use fresh fruit, evenly ripened. Pick the fruit from the stems, wash, and pack it in glass jars. Cover with a medium thin sirup (5 pounds of sugar to 10 quarts of water). Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure 5 pounds.....	15
Water seal 214°.....	15	Steam pressure 15 pounds.....	8

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

WILD GRAPES.

Use fresh fruit, evenly ripened. Pick the fruit from the stems and wash. Pack it in glass jars. Cover it with thick sirup (2 pounds of sugar to 1 quart of water). Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure 5 pounds.....	12
Water seal 214°.....	15	Steam pressure 15 pounds.....	8

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

WILD PLUMS AND DAMSON PLUMS.

Grade the fruit for size and ripeness. Wash and pack it in glass jars. Fill the jars with thin or medium thick sirup (7 pounds of sugar to 6 quarts of water). Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	16	Steam pressure 5 pounds.....	12
Water seal 214°.....	12	Steam pressure 15 pounds.....	8

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

HUCKLEBERRIES.

Steam and clean the huckleberries. Pack them in glass jars or enameled tin cans. Fill the jars with medium thin sirup. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure 5 pounds.....	15
Water seal 214°.....	15	Steam pressure 15 pounds.....	10

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars to prevent bleaching.

HARD FRUITS.**PINEAPPLE.**

Use sound, ripe fruit. Prepare, peel, and core it. Remove all eyes. Cut the fruit into convenient cross sections and blanch it 3 minutes. Cold dip the fruit. Pack it in glass jars or enameled tin cans. Pour on thin or medium sirup (6 pounds of sugar to 9 quarts of water). Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure 5 pounds.....	10
Water seal 214°.....	15	Steam pressure 15 pounds.....	8

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

FIGS.

Select and grade the stock. Blanch it 6 minutes in boiling water and cold dip. Pack it in glass jars or tin cans. Fill them with medium thin sirup. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	40	Steam pressure 5 pounds.....	25
Water seal 214°.....	30	Steam pressure 15 pounds.....	20

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars in paper to prevent bleaching.

RHUBARB.

Wash the stalks clean. Cut them into pieces three-fourths of an inch in length (do not remove the skin). Blanch them 2 minutes. Cold dip. Pack them in glass jars (do not use tin cans). Pour on thick sirup (3 pounds of sugar to 1 quart of water). Put the rubber and cap in position, not tight.

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure 5 pounds.....	15
Water seal 214°.....	15	Steam pressure 15 pounds.....	10

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars in paper to prevent bleaching.

PRESERVES.**STRAWBERRY.**

Make a sirup of 1 quart of water and 11 pounds of sugar and cook it in an open kettle until a candy thermometer registers 265° when placed in the sirup. Add 8 pounds of berries to the sirup. Cook very slowly, just at the boiling point. Stop the cooking when the thermometer registers 219° and pour into shallow pans to cool. Hasten the cooling by pouring sirup over the berries. Skim while cooling. Fill into jars when cold and allow them to stand unsealed for 4 days. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure (see note under cherry pre-	
Water seal 214°.....	15	serves).....	15

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars in paper to prevent bleaching.

CHERRY.

Place 1 gallon of water in a kettle and add 10 pounds of pitted cherries. Boil slowly for 18 minutes. Add 12 pounds of granulated sugar and cook until the product is boiling at a temperature of 219°. Cool quickly in shallow pans. Pack into glass jars. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	20	Steam pressure (see note).....	15
Water seal 214°.....	15		

NOTE.—When using pressure-cooker outfits on preserves, keep the valve open during period of sterilization.

SUN PRESERVES.**STRAWBERRY.**

Select ripe, firm berries. Pick and preserve them the same day. Hull and rinse as in No. 1. Place them in a shallow platter in a single layer; sprinkle sugar over them; pour over them 40° sirup (same as strawberry preserves, above, boiled thicker). Cover them with a glass dish or a plain window glass. Allow them to stand in the hot sun 8 or 12 hours. Pack them in glass jars or cups; tie paper over the tops or cover with paraffin or sealing wax. Keep in cool, dry place.

PECTIN FROM APPLE POMACE FOR JELLY MAKING.

To 25 pounds of apple pomace add 1 ounce of tartaric or citric acid and 100 pounds of water. Boil slowly for 60 minutes, and press the liquid from the pomace in a cider press. Filter the liquid through a Canton-flannel bag. The pectin of the pomace will be in this extract.

When it is desired to make a good quality of jelly from fruit juices that do not jelly readily, add this pectin after sugar has been dissolved in the juice.

(Pure lactic acid may also be used in the above process for making pectin. Jellies made with pectin thus prepared, if offered for sale, should be so labeled as to show the presence of added pectin and whatever acid has been used in its preparation.)

VEGETABLES.**EGGPLANT.**

Remove the skin of the eggplant and slice across the fruit. Make the slices about one-half to three-fourths of an inch thick. Blanch them 3 minutes in boiling water to which has been added a tablespoonful of salt per quart. Plunge them into cold water and pack them in glass

jars. Fill with boiling hot water and add a level teaspoonful of salt per quart. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	50	Steam pressure 5 pounds.....	45
Water seal 214°.....	45	Steam pressure 15 pounds.....	30

SWEET PEPPERS.

Use either red or green peppers. Place the peppers in the oven and bake them until the skins separate from the meat. Remove the skins. Pack them solid in glass jars or tin cans. Add no boiling water. Add 1 level teaspoonful of salt per pint. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	90	Steam pressure 5 pounds.....	60
Water seal 214°.....	75	Steam pressure 15 pounds.....	40

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

CORN AND TOMATO (COMBINATION).

Blanch fresh corn on the cob 6 minutes. Cold dip it. Cut the corn from the cob, cutting from tip to butt. Blanch the tomatoes 1½ minutes and cold dip. Remove the skin and core. Chop the tomatoes into medium-sized pieces. Mix thoroughly 2 parts of tomatoes with 1 part of corn. Pack the mixture in glass jars or tin cans. Add a level teaspoonful of salt per quart. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	90	Steam pressure 5 pounds.....	60
Water seal 214°.....	75	Steam pressure 15 pounds.....	45

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

CORN, TOMATOES, AND STRING BEANS (COMBINATION).

Use 1 part of corn, 1 part of green string beans, and 3 parts of tomatoes. Blanch fresh corn on the cob for 6 minutes and cold dip. Cut the corn from the cob, cutting from tip to butt. Prepare string beans and cut them into convenient lengths. Blanch them 4 minutes and cold dip. Blanch the tomatoes 1 to 3 minutes and cold dip. Remove the skin and core. Cut the tomatoes into medium-sized pieces. Mix thoroughly. Pack the mixture in glass jars or enameled tin cans. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	90	Steam pressure 5 pounds.....	60
Water seal 214°.....	75	Steam pressure 15 pounds.....	45

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

CABBAGE OR BRUSSELS SPROUTS.

Use small, solid heads. Cut them into convenient sections and remove the core. Blanch 10 minutes. Cold dip. (See cauliflower.) Pack it in glass jars or enameled tin cans. Pour on boiling water and add a level teaspoonful of salt per pint. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	90	Steam pressure 5 pounds.....	60
Water seal 214°.....	75	Steam pressure 15 pounds.....	45

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

CAULIFLOWER.

Use the flowered portion. Blanch it 3 minutes. Plunge it into cold brine (one-half pound salt to 12 quarts of water.) Allow the cauliflower to remain in this brine for 12 hours. Pack it in glass jars or enameled tin cans. Fill them with boiling water and add a level teaspoonful of salt per quart. Put the rubber and cap in position, not tight. (Cap and tip if using enameled tin cans.)

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	45	Steam pressure 5 pounds.....	30
Water seal 214°.....	35	Steam pressure 15 pounds.....	20

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

MUSHROOMS.

Caution.—Unless you are absolutely sure that you know a mushroom when you see it, do not run the risk of gathering and using for food what you may think are mushrooms. A very large number of people are poisoned every year because of carelessness along this line. There are a number of very poisonous plants which resemble the edible mushroom very much. Can mushrooms immediately after picking; if allowed to stand they become unfit for use. (See Farmer's Bulletin 204, Cultivation of Mushrooms.)

Canning of mushrooms.—Wash and trim the mushrooms. If small, can them whole; if large, they may be cut into sections. Blanch the mushrooms in boiling water for 5 minutes. Remove and plunge them quickly into very cold water. Pack them in glass jars, and add boiling water to cover them; add 1 level teaspoonful of salt to the quart. Place the rubber and cap in position, not tight.

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.		Minutes.
Water bath, homemade or commercial.....	90	Steam pressure 5 pounds.....	50
Water seal 214°.....	60	Steam pressure 15 pounds.....	20

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars in paper to prevent bleaching.

If one is canning mushrooms in tin, always use lacquered cans. Do not fail to blanch and cold dip mushrooms before packing. Remove the mushrooms immediately and use them as quickly as possible after opening the cans.

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WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**UTILIZING WINDFALL AND CULL APPLES AND APPLE BY-PRODUCTS.**

By O. H. BENSON, *in Charge of Boys' and Girls' Club Work.*

[This circular is a part of the series of follow-up instructions used in the home canning club work in the Northern and Western States, the complete series including NR-21, NR-22, NR-23, NR-24, NR-25, NR-26, NR-28, NR-29, and NR-30.]

To be able to transform the windfall and cull apples into a valuable and palatable food product, available for home consumption throughout the entire year, is a great advantage worth the consideration of all apple growers. This circular gives some new recipes for using windfalls and culls profitably; such as canning the apples whole, sliced for pie filling, and quartered for fruit salads; directions for sterilizing cider to keep it sweet and unfermented throughout the year; and a method for making apple sirup.¹

Select only reasonably sound fruit. Do not can any decayed part, nor allow apples to become overripe before canning.

RECIPE FOR CANNING WHOLE, REASONABLY FIRM APPLES.

Wash the apples. Remove core and blemishes (pare if desirable when for immediate use). Place whole apples in blanching tray or blanching cloth and blanch in boiling water for two minutes. Remove and plunge quickly into cold water. Pack in large, empty glass jars or gallon tin cans. Pour over the product a hot, thin sirup of about 18° density. Place rubber and top in position. Seal partially, not tight. (If using tin cans, cap and tip completely.) Process half-gallon or gallon containers 20 minutes in boiling hot water, in homemade or hot-water bath outfit; 15 minutes in water-seal; 10 minutes in steam-pressure outfit, with 5 pounds of steam pressure; or 5 minutes in aluminum pressure-cooker outfit, under 15 pounds of steam pressure. Remove jars, tighten covers, invert to cool, and test joints. Wrap in paper and store. The time of heating will have to be varied according to ripeness and condition of the fruit. Use just enough time to sterilize perfectly, and yet not enough to change the color or reduce the pulp to sauce.

Firm and tart apples may be cored and peeled first, then canned by the above recipe.

NOTE.—This circular is concerned with products prepared primarily for home consumption. If any of them are to be offered for sale, it should be remembered that all such products sold within a State are subject to State laws and regulations regarding quality, labels, etc., and that those sold within the District of Columbia or intended for interstate shipment must also conform to the requirements of the Federal Food and Drugs Act of June 30, 1906, as amended. These requirements should therefore be thoroughly understood before the preparation of any of the products for sale is undertaken.

¹ The recipe for this sirup was furnished by H. C. Gore, of the Bureau of Chemistry.

USES FOR CANNED APPLES.

- (1) Breakfast dish, with cream and sugar added.
- (2) Baked, like fresh apples, for breakfast or for other meals.
- (3) Apple salad, often served for lunch or supper.
- (4) A relish with roast pork. The apples may be fried in the pork fat or the cores may be cooked with roast pork for flavoring.
- (5) Apple dumplings, deep apple pie, and other desserts in which whole apples are desirable.
- (6) The sirup of canned whole apples can be used for pudding sauces or fruit drinks.

RECIPE FOR CANNING APPLES FOR PIE FILLING.

Wash, core, pare, and remove all decayed or injured spots. Slice apples quickly into a basin or vessel containing slightly salted cold water (about 1 teaspoonful per gallon) to keep from discoloring. Pack fresh cold product in glass jars or tin cans. Add one cupful of hot, thin sirup of about 18° density to each quart of fruit. If using glass cans, put on the rubbers, and screw on the tops, but do not seal completely. If using tin cans, cap and tip, sealing up completely. Sterilize 12 minutes in hot-water bath, homemade outfit; 10 minutes in water-seal outfit; 6 minutes under 5 pounds of steam pressure; or 4 minutes in aluminum pressure cooker. Remove jars, tighten covers, invert to cool, and test joints. Wrap in paper and store.

NOTE.—This filling can be used for making apple pies in the same way that fresh apples would be used, with the exception that the sirup must be poured off, and less sugar should be used. Since the apples have already been cooked, only enough heat is needed to cook the crust and warm the apples through. Pies may be baked in 7 minutes. The pies made with these apples are, in the opinion of many housekeepers, as good as those made with fresh fruit, and they can be made in less time and are less expensive.

RECIPE FOR CANNING QUARTERED APPLES FOR FRUIT SALADS.

Select best grade of culls of firm and rather tart varieties. Core, pare, and quarter. Drop into basin containing slightly salted cold water. Pack these quartered pieces tightly in jar or tin container. Add a teacupful of thin, hot sirup to each quart. Place rubber and top in position, partially seal, not tight. Cap and tip completely tin cans. Sterilize 12 minutes in hot-water bath, homemade outfit; 10 minutes in water-seal outfit; 6 minutes under 5 pounds of steam pressure; or 4 minutes in aluminum pressure cooker. Remove jars, tighten covers, invert to cool, and test joints. Wrap in paper and store.

KEEPING APPLE CIDER SWEET BY THE HOME-CANNING METHOD.

Fill fruit jars with the fresh apple cider. Add a tablespoonful of sugar to each quart. Place rubber and cap in position and partially tighten (cap and tip in case of tin cans). Sterilize in the hot-water bath outfit for 10 minutes; in the water-seal outfit for 8 minutes; in the steam-pressure outfit, under 5 pounds of steam, for 4 minutes; or in the aluminum pressure cooker for 2 minutes. Remove jars, tighten cover, invert to cool, and test joints.

NOTE.—If you desire the apple cider to be a little tart or slightly fermented, it will be necessary to let it stand for two or three days before you sterilize, and then add about two minutes of time to each schedule given in the recipe.

REDUCING SWEET APPLE CIDER TO SIRUP.

It may not be practical for the average fruit farmer to make apple sirup as a commercial proposition, but during seasons when there are a large number of culls and windfalls, when markets are glutted, and no profitable market for apples, it is a matter of business economy to utilize by-products and the making of apple sirup for the family's use is quite worth while.

NOTE.—Wash apples, remove all decayed and worm-eaten spots, and press out juice as usual for cider making. Be sure the juice does not ferment or "work," as only sweet cider should be used for sirup making. The sterilizing, reducing vat, or kettle should be a third larger than required to hold contents.

RECIPE FOR APPLE SIRUP.

Add 5 ounces of powdered calcium carbonate to 7 gallons of apple cider. Powdered calcium carbonate (carbonate of lime), or, to give it its common name, precipitated chalk, is a low-priced, harmless chemical available at any drug store. Boil in kettle or vat vigorously for a period of five minutes. Pour the liquid into vessels, preferably glass jars or pitchers, allow to stand six or eight hours, or until perfectly clear. Pour the clear liquid into preserving kettle. Do not allow sediment at bottom to enter. Add to the clear liquid one level teaspoonful of carbonate of lime and stir thoroughly. The process is completed by boiling down rapidly to a clear liquid. Use density gauge or candy thermometer and bring it up to 220° F., or, without thermometer, reduce bulk to one-seventh of original volume. To see whether it is cooked enough, test as you would sirup or candy, by pouring a little of it into cold water. If boiled enough, it should have the consistency of maple sirup. It should not be cooked long enough to harden like candy when tested. When the test shows that the sirup has been cooked enough, pour it into fruit jars, pitchers, etc., and allow it to cool slowly. Slow cooling is important, as otherwise the suspended matter will not settle properly and the sirup will be cloudy. A good way to insure slow cooling is to stand the vessels full of sirup in a bucket or a wash boiler of hot water. They may also be placed in a fireless cooker. The white sediment which settles out during cooling is called "malate of lime" and is a harmless compound of lime with the natural acid of the apple. When the sirup is cooled, it should be stored in fruit jars or bottles. Place the rubber cap or cork in position and tighten. Then place the bottles or cans of sirup in hot water and sterilize for 12 minutes in hot-water or wash-boiler outfit, 10 minutes in water-seal outfit, 8 minutes in steam-pressure outfit under 5 pounds of steam, or 5 minutes in aluminum pressure cooker under 15 pounds of pressure.

Apple sirup made by this method is a very palatable and high-grade product. It has a flavor much like the thick sirup or jelly which is so often formed when apples are baked with a little sugar. As shown by experiments made by the Government experts, this apple sirup can be used in cooking with good results, as well as for table purposes.

The recipes given herewith show the time requirements for the four different types of canning outfits, but this does not mean that the fruit or cider must be subjected to all four processes in four different types of outfits. Only one should be used. The four time requirements are given so that the one using the recipes will have complete instructions to follow, regardless of the type of outfit available for the work.

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WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

RECIPES FOR THE USE OF POTATOES AND HOMEMADE¹ POTATO STARCH.

Prepared for Office of Extension Work, North and West, by MARIE WILLOUGHBY ROGERS, *Office of Home Economics.*

POTATO STARCH RECIPES.

WHITE SAUCE.

2 tablespoons potato starch.	$\frac{1}{4}$ teaspoon salt.
2 tablespoons butter.	Few grains of pepper.
1 cup milk.	

Rub together butter and starch in saucepan; add seasoning. Pour on the scalded milk gradually, stirring constantly until well mixed, then beat until smooth and glossy.

By heating the butter and flour together in a saucepan and adding the cold milk one can save the use of a second vessel. Time can also be saved in making white sauce in this way, because of the higher temperature obtained when heating butter.

BOILED CUSTARD.

4 tablespoons potato starch.	4 eggs.
8 tablespoons sugar.	$\frac{1}{2}$ teaspoon salt.
1 quart milk.	1 teaspoon vanilla.

Beat eggs slightly; add sugar and salt. Mix potato starch with a little milk, add the remainder of the milk, and cook in double boiler for five minutes, or until it thickens. Pour gradually over the eggs, stirring constantly. Cook in double boiler for a few minutes longer. Watch the boiling custard carefully, for if cooked too long it will curdle. Add vanilla just before removing from fire. If a thicker custard is desired, use a little more starch.

This custard may be adapted to a number of uses. It may be used as a sauce for sponge cake, or, when chilled thoroughly, it is delicious poured over various kinds of stewed fruit.

It is not necessary to use the whites of the eggs in the custard. They may be beaten to a stiff froth, sweetened to taste, and poured over the custard, making a nourishing dessert known as "floating island."

The whites of the eggs may also be used in making snow pudding, over which is poured the boiled custard.

FROZEN CUSTARD.

Custard made rather thin, and with or without fresh or canned fruit added, may be frozen. Such frozen custard with lady fingers (see p. 3) is a nutritious as well as palatable dessert.

¹ For directions for preparing home-made potato starch consult Form O-4, Potato starch and its use in the home.

LEMON PUDDING.

8 tablespoons potato starch.	4 eggs.
$\frac{3}{4}$ cup sugar.	1 quart milk.
2 tablespoons butter.	Juice and grated rind of 2 lemons.

Beat yolks of eggs slightly, add sugar, butter, and juice and grated rind of lemons. Mix starch in a little cold water and add scalded milk gradually. Then add the previously mixed ingredients and cook in double boiler, stirring constantly until the mixture is quite thick. Add whites of eggs beaten stiff. Pour into a mold, chill, and serve with cream and sugar.

FRUIT BLANC MANGE.

3 $\frac{1}{2}$ tablespoons potato starch.	Sugar to sweeten.
1 pint fruit juice.	

Put juice in saucepan, sweeten to taste, and place over fire until it boils. Add starch which has been previously mixed with cold water. Pour into a mold and set away to cool. Serve with boiled custard (see p. 1) or with whipped cream and sugar.

BATTER PUDDING WITH FRUIT.

4 tablespoons potato starch.	1 pint milk.
6 tablespoons sugar.	$\frac{1}{2}$ teaspoon salt.
Yolks of 5 eggs.	

Beat egg yolks until lemon colored, add sugar, and beat again until light. Add starch mixed in cold milk. Add above mixture to 1 quart of milk at boiling point. Stir until thickened. Pour into baking dish, and set in oven and bake. Place over top a layer of canned peaches or any other available fruit. Cover with a meringue made of the whites of eggs, allowing 1 tablespoon sugar to each egg. Put in oven until the meringue is light brown.

POTATO STARCH LEMON PIE.

4 tablespoons potato starch.	3 tablespoons lemon juice.
$\frac{3}{4}$ cup sugar.	Grated rind of 1 lemon.
$\frac{3}{4}$ cup boiling water.	1 teaspoon butter.
2 egg yolks.	

Mix potato starch and sugar; add boiling water, stirring constantly. Cook 5 minutes; add butter, egg yolks, and rind and juice of lemon. Pour mixture into crust which has been previously cooked. Cover with meringue made of the whites of the eggs. Return to oven to brown meringue.

POTATO STARCH SPONGE CAKE.

6 eggs.	Grated rind $\frac{1}{2}$ lemon.
1 cup sugar.	$\frac{3}{4}$ cup potato starch.
1 tablespoon lemon juice.	$\frac{1}{2}$ teaspoon salt.

Beat yolks until thick and lemon colored, add sugar gradually, and continue beating. Add lemon juice, rind, and whites of eggs beaten until stiff and dry. When whites are practically mixed with yolks, carefully cut and fold in potato starch mixed with salt. Bake one hour in a slow oven, in an angel-cake pan or deep narrow pan.

LADY FINGERS.

Whites of 3 eggs.	4 tablespoons potato starch.
$\frac{1}{2}$ cup powdered sugar.	$\frac{1}{2}$ teaspoon salt.
Yolks of 2 eggs.	$\frac{1}{2}$ teaspoon vanilla.

Beat whites until stiff and dry; add sugar gradually, and continue beating. Then add yolks of eggs, beaten until thick and lemon colored, then add flavoring. Cut and fold in potato starch mixed with salt. Using a pastry bag and tube, or a cornucopia made of paper and having a small opening at the pointed end, force the batter into the desired shape. Shape $4\frac{1}{2}$ inches long, 1 inch wide, on a tin sheet covered with unbuttered paper. Sprinkle powdered sugar over them, and bake 8 or 10 minutes in a moderate oven. Remove from paper with knife.

Lady fingers are often served with frozen desserts. They may be put together in pairs, with a thin coating of whipped cream between. Very commonly they are used for lining molds that are to be filled with whipped-cream mixtures.

POTATO STARCH ANGEL CAKE.

Whites 8 eggs.	$\frac{3}{4}$ cup potato starch.
1 teaspoon cream of tartar.	$\frac{1}{2}$ teaspoon salt.
1 cup fine granulated sugar.	$\frac{3}{4}$ teaspoon vanilla.

Beat whites of eggs until frothy, add cream of tartar, and continue beating until eggs are stiff and flaky; then add sugar gradually. Cut and fold in potato starch mixed with salt and sifted several times, and add vanilla. Bake 45 to 50 minutes in a moderate oven, in an unbuttered angel-cake pan. After cake has risen and begins to brown it may be covered with a buttered paper. When done, loosen the cake around the edge and turn out at once.

POTATO RECIPES.**POTATO SOUP.**

3 potatoes, of medium size.	$1\frac{1}{2}$ teaspoons salt.
4 cups skim milk.	$\frac{1}{2}$ teaspoon celery salt, or
1 small onion.	2 tablespoons celery, cut in small pieces.
4 tablespoons butter.	$\frac{1}{2}$ teaspoon chopped parsley.
2 tablespoons flour.	Little cayenne pepper or paprika.

Boil the potatoes, and when soft rub them through a sieve. Slice the onion and scald this and the celery with the milk. Take out the onion and add the milk slowly to the potatoes. Melt 2 tablespoons butter, into which mix the dry ingredients, and stir into the boiling soup. Boil one minute; strain, add the remainder of the butter, and sprinkle with the parsley when ready to serve. The parsley improves the looks and adds a little to the flavor, but may be omitted if this is more convenient.

BOILED POTATOES.

Select potatoes of uniform size. Wash, pare, and drop at once into cold water to prevent them becoming discolored. Cook in boiling salted water until soft, but not until broken. For six medium-sized potatoes allow 1 tablespoon salt and boiling water enough to cover. When the potatoes are done, drain off the water, place the uncovered kettle on the back of the stove, and let them steam until serving time.

When potatoes are boiled with their jackets on they should be washed and a narrow band of skin cut from the center. This tends to let the steam escape more rapidly and renders the potato more mealy and palatable. It also makes it easier to remove the skin at table. Potatoes boiled in this way are palatable for several hours if kept hot uncovered on the back of the stove.

BAKED POTATOES.

Select smooth, medium-sized potatoes. Wash, using a vegetable brush. Bake in a hot oven for about 45 minutes, or until soft. Remove from the oven, break the skin slightly to let the steam escape, and serve at once. When potatoes are baked properly they are commonly said to be especially wholesome. However, they are better cooked in boiling water than baked in a slow oven.

STUFFED POTATOES.

A nice way to secure variety is to cut a slice from the top of each baked potato and scrape out the inside. Mash, season with salt, pepper, chopped parsley (if liked), and butter, and heat in a little hot milk; add 2 well-beaten whites of eggs. Refill the skins, sprinkle with grated cheese, and bake in a hot oven about six minutes.

MASHED POTATOES.

Force five hot boiled potatoes through a potato ricer or a colander (coarse strainer). Add 2 tablespoons butter, 1 teaspoon salt, a little pepper, and one-third cup of hot milk; beat with a fork until creamy. Reheat, and serve in a hot vegetable dish. This quantity is sufficient for a family of four.

RICED POTATOES.

Force hot boiled potatoes through a potato ricer or a coarse strainer into a hot dish in which they are to be served. Mashed and riced potatoes may be browned by placing the dish in the oven for a few minutes.

SCALLOPED POTATOES.

Wash and pare potatoes; let them soak for a half hour, and cut in $\frac{1}{4}$ -inch slices. Butter a baking dish, put in a layer of the sliced potatoes, sprinkle with salt and pepper, dredge with flour, and dot over with $\frac{1}{2}$ tablespoon of butter. (A little grated cheese may be sprinkled over each layer if desired.) Repeat until the baking dish is nearly filled, then cover with hot milk. Bake $1\frac{1}{2}$ hours in a moderate oven, or place on the back of the stove and cook slowly.

SARATOGA CHIPS.

Wash and pare the potatoes. Cut in thin slices (using vegetable slicer preferably) and drop at once into cold water. Let soak two hours, changing water two or three times; drain, drop into boiling water, and boil one or two minutes. Dip out with skimmer and plunge into cold water again. Take from the water, dry between towels, and fry in deep fat until light brown. Drain on brown paper and sprinkle with salt. Plunging the potatoes into hot water and boiling them for a minute or two causes the starch particles to swell and become set. The "chips" will, therefore, absorb very little fat, and are more crisp and palatable than when dropped at once into deep fat.

CREAMED POTATOES.

There are several different ways in which creamed potatoes may be prepared. (1) Freshly boiled or cold boiled potatoes may be cut into small cubes and served heated in cream sauce. (2) Wash, pare, and cut potatoes into small cubes. Put into frying pan with a few slices of onion cut up very fine, and parboil 10 minutes. Pour off water. Add one tablespoon butter, seasoning of salt and pepper, and milk enough to cover. Cook for 15 or 20 minutes, or until the potatoes are well done and the sauce thick and creamy. It is necessary to stir the potatoes frequently to prevent sticking. The starch in the potatoes thickens the sauce.

FRENCH FRIED POTATOES.

Wash, pare, and cut into eighths lengthwise. Soak in cold water one hour; drain, and dry between towels. Fry in deep fat, which must not be too hot. Drain on brown paper and sprinkle with salt.

SHOESTRING POTATOES.

Potatoes cut in long, narrow strips and prepared by the above recipe are called Julienne or shoestring potatoes.

PANNED POTATOES.

Cut cold boiled potatoes into quarter-inch slices; dredge lightly with flour and fry in pan with a little butter. When light brown, heap on side of pan; let stand a few minutes, then loosen with a knife and turn out on a platter in much the same way that an omelet is taken out. Sprinkle with salt and serve at once.

HASHED BROWN POTATOES.

Cut cold boiled potatoes into small pieces (2 cupfuls), season with salt and pepper, cook 3 minutes in one-third cup bacon drippings, stirring constantly. Let stand a few seconds to brown underneath; fold like an omelet, and serve on a hot platter.

PAN FRIED OR SAUTÉED POTATOES.

Slice cold boiled potatoes in quarter-inch pieces; season with salt and pepper, and brown on both sides in well-greased frying pan.

POTATO SALAD.

Cut cold boiled potatoes into half-inch cubes and season with salt and pepper, or a few drops of onion juice if desired. Heap in a mound in a salad dish, garnish around edge with a circle of lettuce and hard-boiled eggs, and pour over all a French dressing made as follows:

$\frac{1}{2}$ teaspoon salt.	}	4 tablespoons olive oil.
$\frac{1}{8}$ teaspoon cayenne.		Little onion juice.
2 tablespoons vinegar.		

Mix the ingredients in the order named, and stir until well mixed. For variety add to 2 cupfuls of potato one-half cupful of cold beet dice (cooked) and 2 tablespoons chopped parsley or cheese; carrots and a little chopped celery leaf may be used if preferred.

Many cooked or canned left-over vegetables may be attractively used for salads. Dice of turnips and carrots cut in fancy shapes are often used in potato salad. Left-over beans, peas, etc., may be used to fill tomato cups and served with a French or a mayonnaise dressing.

MAYONNAISE DRESSING.

$\frac{1}{2}$ teaspoon salt.	Yolk of 1 egg.
$\frac{1}{4}$ teaspoon mustard.	3 tablespoons lemon juice.
Little cayenne.	1 cup olive oil, or cooking oil.

Mix the dry ingredients; add the egg yolk, and beat for 5 minutes. At first add oil drop by drop, stirring constantly. Add oil and lemon juice alternately, beating constantly.

The secret of making good mayonnaise is to have the oil and the mixing bowl cold. The bowl containing the mixture should be set in a large bowl of crushed ice. A fork or a good egg beater may be used to mix the dressing.

Recommended by O. H. BENSON,
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Approved:

C. B. SMITH,
Chief, Office of Extension Work, North and West.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

HOME CANNING CLUB INSTRUCTIONS TO SAVE FRUIT AND VEGETABLE WASTE. FRUITS.

For convenience we suggest that fruits be classified into four distinct groups, or classes, such as soft fruits, sour berry fruits, hard fruits, and citrus fruits.

1. Soft fruits, such as strawberries, blackberries, dewberries, sweet cherries, blueberries, peaches, apricots, etc.

Recipe for canning soft fruits.—Can the same day fruit is picked. Grade and rinse the fruit by pouring water over it through a strainer. Cull, seed, and stem. Pack immediately in glass jars or tin cans. Add boiling hot sirup of 18 per cent density (thin). Place rubber and top in place. Partially tighten. (Cap and tip tin cans.) Sterilize in hot-water bath outfit 16 minutes; in water-seal outfit, 10 minutes; steam-pressure outfit under 5 pounds steam, 8 minutes; in aluminum pressure cooker, with 10 pounds of steam, 5 minutes. Remove. Tighten covers. Invert to cool and test joints. Wrap glass jars in paper to prevent bleaching; then store.

2. Sour berry fruits, such as currants, gooseberries, cranberries, and sour cherries.

Recipe for canning sour berry fruits.—Can same day picked. Stem, hull, and clean. Blanch in hot water 1 minute. Remove and dip quickly in cold water. Pack berries closely in container. Add hot sirup of 28 per cent density until full. Place rubber and cap in place. Seal partially, not tight. (Cap and tip tin cans.) Sterilize in hot-water bath outfit 16 minutes; in water-seal outfit, 12 minutes; in 5-pound steam-pressure outfit, 10 minutes; in aluminum pressure-cooker outfit under 15 pounds of steam, 5 minutes. Remove jars. Tighten covers and invert to cool and test joints. Wrap in paper and store.

3. Hard fruits, such as apples, pears, quinces, etc.

Recipe for canning hard fruits.—Grade, blanch $1\frac{1}{2}$ minutes, and plunge quickly in cold water. Core, pit, or remove skins, if necessary. Pack whole, quartered, or sliced, as desired. Add boiling-hot sirup of from 18 to 28 per cent density (medium thin). Place rubbers and tops in position. Partially tighten. (Cap and tip tin cans.) Sterilize 20 minutes in hot-water bath outfit; 12 minutes in water-seal outfit; 8 minutes under 5 pounds steam in steam-pressure outfit; 6 minutes in aluminum pressure cooker under 15 pounds pressure. Remove jars. Tighten covers and invert to cool and test joints. Wrap glass jars in paper to prevent bleaching, and store.

4. Citrus fruits—oranges, canned whole for breakfast dishes or sliced for fruit salads. The object of canning citrus fruits is, first, to save the surplus and by-products; second, to furnish wholesome fruits at reasonable cost to more of our people; third, to help the producer to transform by-products into net profits.

Recipe for canning whole oranges.—Select windfall or packing-plant culls. Use no unsound or decayed fruit. Remove skins and white fiber on surface. Blanch fruit in boiling water $1\frac{1}{2}$ minutes. Dip in cold water quickly. Pack containers full. Add boiling-hot sirup of about 18 or 20 per cent density. Place rubber and cap in position. Partially seal, not tight. (Cap and tip tin cans.) Sterilize 12 minutes in hot-water bath outfit; 8 minutes in water-seal outfit; 6 minutes in steam-pressure outfit under 5 pounds of steam; 4 minutes in aluminum pressure-cooker outfit under 15 pounds of steam. Remove jars. Tighten covers. Invert to cool and test joints. Wrap glass jars with paper to prevent bleaching, and store.

Recipe for canning sliced oranges for salad purposes.—The oranges may be divided into their natural sections or sliced with a knife. Pack jar or container full. Pour over product hot sirup of 18 per cent density. Place rubber and cap in position. Partially seal, not tight. (Cap and tip tin cans.) Sterilize 10 minutes in hot-water bath outfit; 6 minutes in water-seal outfit; 5 minutes in steam-pressure outfit with 5 pounds steam; 4 minutes in aluminum pressure-cooker outfit under 10 pounds steam. Remove jars. Tighten covers. Invert to cool and test the joints. Wrap jars with paper to prevent bleaching, and store.

CLASSES OF VEGETABLES.

For convenience in the discussion of canning recipes and methods of procedure, we divide vegetables into five classes.

1. Vegetable greens, both wild and cultivated.

Recipe for canning vegetable greens.—Prepare and can the day picked. Sort and clean. Blanch in a vessel with a little water under false bottom or in a regular steamer, 15 to 20 minutes. Remove. Plunge quickly into cold water. Cut in convenient lengths. Pack tight in jar or container and season to taste; add a little chipped beef, olive oil, etc. Add hot water to fill crevices, and a level teaspoonful of salt to each quart. If using glass jars place rubber and top in position, partially seal; if using tin cans, cap and tip completely. Sterilize 90 minutes in hot-water bath outfit; 60 minutes in water-seal; 50 minutes in steam-pressure outfit under 5 pounds of steam; 25 minutes in aluminum pressure-cooker outfit at 15 pounds of steam. Remove from canner. Tighten covers. Invert to cool and test joints. Wrap in paper to prevent bleaching and store.

EDIBLE CULTIVATED GREENS.

Swiss chard.	Spinach.
Kale.	Beet tops.
Chinese cabbage leaves.	Cultivated dandelion.
Upland cress.	Dasheen sprouts.
French endive.	Native mustard.
Cabbage sprouts.	Russian mustard.
Turnip tops.	Collards.
New Zealand spinach.	Rape.
Asparagus.	

EDIBLE WILD GREENS.

Pepper cress.	Dandelion.
Lamb's-quarter.	Marsh marigold.
Sour dock.	Wild mustard.
Smartweed sprouts.	Milkweed (tender sprouts and
Purslane or "pusley."	young leaves).
Pokeweed.	

The following table for spinach will illustrate approximately what are the constituent parts of vegetable greens:

	Per cent.
Water content.....	92.3
Protein.....	2.1
Fat.....	.3
Carbohydrates.....	3.2
Mineral matter or ash.....	2.1

CABBAGE, BRUSSELS SPROUTS, AND CAULIFLOWER.

The recipe for canning these vegetables is practically the same as for the above-named vegetable greens, and the same instructions may be followed.

Experience alone will teach the slight variations necessary in amount of time required for blanching, amount of seasoning necessary for the various vegetable greens, etc.

2. Root and tuber vegetables, such as carrots, parsnips, beets, turnips, sweet potatoes, etc.

Recipe for canning root and tuber vegetables.—Grade for size, color, and degree of ripeness. Wash thoroughly. Use vegetable brush. Scald in boiling hot water sufficiently to loosen skin. Plunge quickly in cold water. Scrape or pare to remove skin. Pack whole or cut in sections or cubes, as required by the home or market standard. Add boiling hot water and one level teaspoonful of salt to the quart. Place rubbers and tops in position. Partially seal, but not tight. (Cap and tip tin cans.) Sterilize 90 minutes in hot-water bath outfit; 75 minutes in water-seal outfit; 60 minutes in steam-pressure outfit under 5 pounds of steam; 35 minutes in aluminum pressure cooker under 20 pounds of steam.

3. Special vegetables. Tomatoes and corn.

Recipe for canning tomatoes.—Grade for size, ripeness, and color. Scald in hot water enough to loosen skins. Plunge quickly in cold water. Remove. Core and skin. Pack whole. Fill container with whole tomatoes only. Add one level teaspoonful of salt to each quart. Place rubber and cap in position. Partially seal, but not tight. (Cap and tip tin cans.) Sterilize 22 minutes in hot-water bath outfit; 18 minutes in water-seal outfit; 15 minutes in steam-pressure outfit under 5 pounds steam; 10 minutes in aluminum pressure cooker under 20 pounds steam. Remove jars. Tighten covers. Invert to cool and test joints. Wrap jars in paper and store.

Recipe for canning sweet corn on the cob.—Can corn the same day picked. Remove husks, silks, and grade for size. Blanch on the cob in boiling water 5 to 15 minutes. Plunge quickly in cold water. Pack ears, alternating butts and tips, in half gallon glass jars or gallon tin cans. Pour over boiling hot water and add 2 level teaspoonsful of salt to each gallon. Place rubbers and tops in position. Seal partially but not tight. (Cap and tip tin cans.) Sterilize in hot-water bath outfit 180 minutes, one period; 90 minutes in water-seal outfit; 60 minutes in steam-pressure outfit under 5 pounds steam; 35 minutes in aluminum pressure cooker under 20 pounds steam. Remove jars. Tighten covers. Invert to cool and test joints. Wrap glass jars with paper and store.

NOTE.—When sweet corn is taken from jar or tin can for table use, remove ears as soon as jar or can is opened. Heat corn, slightly buttered, in steamer. Do not allow ears to stand in water or to be boiled in water the second time.

Recipe for canning sweet corn cut from cob.—Can the same day as picked. Remove husks and silks. Blanch on the cob in boiling hot water 5 to 15 minutes. Plunge quickly in cold water. Cut the corn from the cob with a thin, sharp-bladed knife. Pack corn in jar tightly until full. Add one level teaspoonful of salt to each quart and sufficient hot water to fill. Place rubber and top in position; seal partially but not tight. (Cap and tip tin cans.) Sterilize 180 minutes in hot-water bath outfit; 90 minutes in water-seal outfit; 60 minutes in steam-pressure outfit under 5 pounds of steam; 35 minutes in aluminum pressure cooker under 20 pounds of steam. Remove jars. Tighten covers. Invert to cool and test joints. Wrap with paper and store.

4. Other vegetables, such as Lima beans, string beans, peas, okra, etc.

Recipe for canning.—Can same day vegetables are picked. Cull, string, and grade. Blanch in boiling hot water for 2 to 5 minutes. Remove and plunge quickly in cold water. Pack in container until full. Add boiling hot water to fill crevices. Add one level teaspoonful of salt to each quart. Place rubbers and tops in position. Partially seal, but not tight. (Cap and tip tin cans.) Sterilize in hot-water bath outfit one period of 120 minutes; 90 minutes in water-seal outfit; 60 minutes in steam-pressure outfit under 5 pounds steam; 40 minutes in aluminum pressure cooker under 20 pounds of steam. Remove jars. Tighten covers and invert to cool. Wrap jars in paper and store.

5. Pumpkin and squash.

Recipe for canning pie filling.—Cut up into convenient sections. Core and remove skins. Cook for 30 minutes to reduce to pulp. Pack in glass jars or tin cans. Add 1 cup of sugar and 1 teaspoonful of salt to each quart of pulp. Place rubber and top in position. Partially seal, but not tight. Sterilize 60 minutes in hot-water bath outfit; 50 minutes in water-seal outfit; 40 minutes in steam-pressure outfit under 5 pounds of steam; 30 minutes in aluminum pressure cooker under 20 pounds of steam. Remove. Tighten covers. Invert to cool and test joints. Wrap in paper and store.

Recipe for canning for special dishes (fried, creamed, baked).—Cut pumpkin or squash into small, uniform size cubes. Blanch in boiling water for 10 minutes. Plunge quickly in cold water. Pack in jar until full. Add boiling hot water and 1 level teaspoonful of salt to the quart. Place rubbers and caps in position, but not tight. Sterilize 60 minutes in hot-water bath outfit; 45 minutes in water-seal outfit; 35 minutes in steam-pressure outfit under 5 pounds steam; 25 minutes in aluminum pressure cooker under 15 pounds of steam.

SCALDING, BLANCHING, AND COLD DIPPING.

These three terms, and your proper understanding of them, are very important. The question is often asked, "Is it not necessary to use the exhaust period in the canning of all fruits and vegetables?" In answer to this, we would say, "No; provided you blanch and cold dip your vegetable products before you pack." The chief object of an exhaust period is to modify and eliminate the objectionable acids and acrid flavors of a vegetable before the pack is finally sealed. The blanching period takes care of this matter. The combination of the blanching and cold dipping of all vegetables are the two factors which make it unnecessary to use the intermittent or fractional sterilization method, which is given in so many of the printed canning instructions.

When a food product has been blanched in boiling hot water or live steam, remove quickly from this and plunge immediately into cold water. The influence of this method upon bacteria, spores, and molds is very effectual. When this is followed by a single period of sterilization, we contend that the success of canning is just as sure as though three periods for three successive days were used, and the interesting part of it is that the product by this method is much better and not overcooked. It is more true to nature in color, flavor, and texture, and more natural in appearance.

Here is another question frequently asked: "What is the difference between scalding and blanching?" These are canning terms and are not used interchangeably. It is true that both refer to the preliminary heating of the product, but they are different in two things: The object of scalding is chiefly to remove skins, and incidentally to take the place of the exhaust period in the canning process; blanching is a term used to indicate a much longer period of preliminary cooking, and its objects are chiefly to eliminate excessive and objectionable acids and acrid flavors, to make it unnecessary to use the exhaust period or practice the intermittent method of canning, and to reduce the bulk of vegetables, such as greens, cabbage, and other products of great bulk.

Scalding.—Three important reasons for scalding fruits and vegetables are as follows:

1. To loosen the skins.
2. To eliminate objectionable acids and acrid flavors.
3. To start the flow of the coloring matter, which is later arrested or coagulated by the cold dip.

Blanching.—Three reasons for blanching are as follows:

1. To eliminate objectionable acids and acrid flavors.
2. To reduce the bulk of vegetable greens.
3. To make it unnecessary to use the exhaust period and intermittent process.

Cold dipping.—Three reasons for using the cold dip in canning are:

1. To harden the pulp under the skin and thus permit the removal of the skin without injury to the pulp.
2. To coagulate the coloring matter and make it harder to dissolve during the sterilization period.
3. To make it easier to handle the products in packing.

USE OF PRESERVATIVES OR CANNING COMPOUNDS.

A great many people have been misled to believe, through advertising matter, that it is both safe and practicable to use canning compounds for the preserving of vegetables which have proven hard to keep under the commonly known methods of canning. By following the directions given in these instructions, by careful blanching and cold dipping all products before packing, followed by a thorough sterilization during the one period, it will be entirely unnecessary to use canning compounds. So the first argument against the use of canning compounds is that it is unnecessary, as it is possible to sterilize any fruit or vegetable by this cold-pack, single-period method of canning, without the use of a compound. The second argument against it is that many of the canning compounds are positively harmful to health. Some of them contain as high as 95 per cent of boric acid. Others contain compounds which have preserving qualities and which are not definitely known to be detrimental to health, but since it is an unnecessary expense, very few people will care to experiment with them. A third argument is the important one that many States and the National Government have pure-food laws which forbid or restrict the use of such preservatives.

CANNING SOUPS AND PUREES.

It is possible to follow the same method given in the recipes for general fruits and vegetables, to can all kinds of combinations for soups, or the concentrated purees, so as to have them ready for immediate use at meal time. A special set of recipes for the canning of soups, soup

stock, etc., can be secured by making application to the Office of Farmers' Cooperative Demonstrations, Northern and Western States, United States Department of Agriculture, Washington, D. C.

CANNING FRUIT JUICES.

In order to can fruit juices, the first important thing to provide is a fruit press, cider mill, or some kind of a contrivance or device which will make it easy and practicable to press the juice from the fruit.

In most cases the canning of fruit juices or sterilization can be accomplished in very much the same way as the canning of the fruit itself, except in preliminary steps and in the methods of rinsing, scalding, and peeling the fruit before pressing and in a slight difference in the amount of time required. Fruit juices as a rule will not stand as much cooking or as high a temperature during the sterilization period without the danger of destroying the natural fruit flavor.

Address the Bureau of Chemistry, United States Department of Agriculture, Washington, D. C., for further instructions on fruit juices.

STANDARDIZING CANNED PRODUCTS.

One of the most important things in connection with the business of home canning is the matter of properly standardizing the products and maintaining this uniform standard from year to year. It will be necessary to secure from the Bureau of Chemistry, as well as from your State office, the instructions governing the State and Federal Pure Food and Drug Act requirements as to measurements, honest pack, weight, purity of product, required printing upon the label, use of trade-marks, etc.

When you have determined these things, then the selection and use of a trade-mark is of considerable importance in the marketing of the product. In the selection of glass jars or tin cans for special products, it is of great importance to the success of the individual enterprise to choose a type of jar or can somewhat different from those commonly found upon the market or used by the commercial canners. Yours should show the evidence of the "home grown and canned products." The appearance of the product through the glass, or the design and artistic make-up of the label, will add much to the value of the product. In the past, the greatest lack, perhaps, in connection with farm and home management has been along the line of standardizing the home-grown products, maintaining the standard, and building up a reputation, getting recognition for trade-marks that represent products of definite standard.

MARKETING CANNED PRODUCTS.

Club members who contemplate developing, in connection with the club, activities of the farm, garden, or orchard, and the sale of the products on a commercial basis, will need to take into account all of the present-day phases of marketing. This includes the proper grading of products, so as to make it possible to label these products and submit to the public an honest pack. The securing of a market for the product is a business proposition and should be taken up in a businesslike way, with the idea that every pack of canned goods sold should bring future sales.

It is important to consider storage facilities. A very profitable investment on the average farm would be a storeroom, or, better, a cold-storage room, where a definite temperature can be maintained and where both fresh and canned products may be stored conveniently for a considerable length of time.

One of the chief merits of canned goods is that it is not necessary to find a market for them as soon as packed. They should be kept in storage until the market is favorable.

In the matter of shipping canned goods to the market great care should be exercised, and when possible small shipments by parcel post, express, or freight should be tried out in comparison with large shipments, to find the comparative cost of shipping the goods. Choose the less expensive and most efficient method.

As a rule it is quite profitable to cater to a special trade of the well-to-do people, the best hotels, restaurants, and dining-car service of the immediate community. The trade should be consulted very carefully before the canning season, with a view to proper selection, size of packs, and grades of products to be prepared, and in many instances by consulting hotel cooks and hotel managers it will be possible to prepare products especially for them and in a way best suited to their purposes. Address the Office of Markets and Rural Organization, United States Department of Agriculture, Washington, D. C., for further information on problems of marketing.

EQUIPMENT FOR HOME CANNING.

When taking up the work on a small scale, it is entirely possible to arrange for successful home canning by using only such equipment as the farm and home may easily provide, such as a wash boiler, galvanized vat, washtub, or other vessel with a well-fitting top, which can be easily transformed into a home canner by making a false bottom with lifting handles. These homemade outfits should be classified under the heading "Hot-water bath outfits." A thermometer, paring and coring knives, wiping cloths, a convenient table for work, plenty of fresh, clean water near at hand, and a watch or clock in a convenient place, where you can check the time as per schedule, will also be needed. If you are using tin cans, you will need soldering flux, lead, sal ammoniac, a soft brick, capping iron, and tipping steel.

Before beginning work and in order that you may understand thoroughly the meaning of all instructions and recipes, you should be familiar with the use and meaning of all the common canning terms, such as bacteria, spores, germs, molds, ferment, yeasts, exhaust, flux, scalding, blanching, tipping, capping, cold pack, sterilizing, processing, density gauge, and other terms used throughout this circular. (See Farmers' Bulletin 521 for definitions of above terms.)

O. V. Benson

In Charge of Boys' and Girls' Club Work in the North and West.

Approved:

C. B. SMITH,

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U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
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STATES RELATIONS SERVICE, OFFICE
OF EXTENSION WORK, NORTH AND
WEST, WASHINGTON, D. C.

HOME CANNING INSTRUCTIONS.

METHODS AND DEVICES.

There are at the present time five methods of canning foodstuffs, as classified for convenience in the work of home canning clubs. These are as follows:

1. The open-kettle, or hot-pack, method.
2. The intermittent, or fractional-sterilization, method.
3. The cold-water method.
4. The cold-pack, single-period method.
5. The vacuum-seal method.

(1) The oldest and most commonly used method is known as the *open-kettle, or hot-pack, method*. This method requires the complete cooking of food products in a vessel before packing or filling the cans and final sealing. All packing of products is done after sterilization has been completed, hence the possibility of new spores and bacteria entering the jars before sealing is always present.

This method will succeed very well with general fruits, but is a failure when applied to the general vegetables, greens, sweet corn, and meats. It is laborious, and discourages much canning, consequently a considerable waste of fruits and vegetables is more in evidence all over the country.

(2) The intermittent, or fractional-sterilization, method of canning fruits, vegetables, and meats is a very successful method, as far as the handling and packing of the product and the effect upon bacteria, spores, and other forms of germs are concerned. By this method complete sterilization is effected, but in the matter of the required three periods of sterilization on three different days, and three liftings of jars in and out of the sterilizer, it is unsatisfactory and quite impractical, in that it requires too much time, too much fuel and heat, consumes too much energy on the part of the club member, farmer, or housewife, and usually overcooks the products.

This method does not encourage the saving of the large amount of inexpensive and most important foods, in the form of vegetables, such as greens, sweet corn, tomatoes, beets, etc.

(3) What is sometimes called the "cold-water" method of canning should not be confused with the "cold-pack" method. The cold-water method is often used in connection with the canning of rhubarb, green gooseberries, and a comparatively few other sour-berry fruits.

We would not recommend this method as practical in club canning, for the reason that most of these products will need to be cooked before they can be used, and it is a saving of both time and labor to do the necessary cooking while the product is being canned.

Recipe, "cold-water" method.—If the "cold-water" method is used, we would suggest that the product be thoroughly washed, placed in a strainer, scalding water poured over it, and the product then packed at once, in practically a fresh state, in the jars, and clean, cold water applied

until the jars are filled. If these steps are taken carefully and quickly, the method, in most cases, will be successful with such products as rhubarb and gooseberries.

(4) The method now in general use by the members of the Home Canning Club Work, as well as many adults all over the United States, is known as the "cold-pack" method of canning. This simply means that the products are packed cold in their fresh and natural state in the glass jars or containers. To the fruits, hot sirup is applied; to the vegetables and greens, hot water and a little salt is added. Then the sterilization is done in the jars or containers, after they are partially or entirely sealed, making it practically impossible for bacteria or spores to enter after the product has once been carefully sterilized or cooked. In following this method vegetables should first be blanched in boiling water or live steam, then *quickly plunged* into cold water and the skins removed, or the products sized. The products are then packed in containers and sterilized according to the instructions and recipes given in leaflets NR 23, 24, 28, 33, 34, 37 of this series and any others prepared for the home canning work.

By this "cold-pack" or cold-fill method of canning, all food products, including fruits, vegetables, and meats, can be successfully sterilized in a single period, with but *one handling* of the product in and out of the canner. The "NR" recipes apply equally well to homemade outfits as they do to the five types of commercial canners. Practically every type of fruit jar manufactured can be successfully handled by this method.

(5) A development of importance to the home canning business is the introduction of specially made jars. After the food product has been blanched, cold dipped, and cooked enough to make it ready for table use, it can be packed in the jars and the vacuum produced. When the jars are perfectly made and the work properly done this method of canning is successful, and can be carried out by the average housewife or club member.

CANNING EQUIPMENT.

The canning outfits available for the sterilization of food products during the canning season may be divided into five general types:

1. *Homemade outfits*, such as wash boilers, tin pails, milk cans, washtubs, and lard pails. These are made especially convenient and efficient when provided with false bottoms, lifting handles, and tight-fitting covers.

2. *Hot-water bath commercial outfits*.—These are constructed usually for out-of-door work, and have a sterilizing vat, lifting trays, fire box, and smoke pipe, all combined in one piece. They are light and convenient, and are planned as portable outfits. They contemplate that the sterilization of the products will be done in completely sealed tin cans or partially sealed glass jars immersed in boiling water. The only advantage of these outfits over the homemade device is that they are made for convenience, and have all the necessary equipment for operation. Both the homemade and hot-water commercial canners are classed as *hot-water bath outfits*.

3. *Water-seal outfits*.—These belong to a type of canning outfit having an inner seal and jacket, and a cover that passes into the seal and between the outer and inner jackets, thus making three tin or galvanized surfaces, and two water columns between the sterilizing vat and the outer surface of the canner. The chief value of this type of canner is in the fact that you can maintain a higher temperature than with the hot-water bath outfits. This is especially valuable in the canning of vegetables or meats, where the higher temperature means so much in the saving of time, fuel, and energy in effecting a complete sterilization of the food products.

4. *Steam-pressure outfits*.—Canners of this type are made to carry from 5 to 30 pounds of steam pressure and are equipped with steam-tight sterilizer, lifting crate, thermometer or pressure gauge, safety valve, and steam pet cock. The pressure canner may be easily regulated so

as to maintain different temperatures and thus adapt them to various vegetables and food products.

5. *Aluminum pressure cooker*.—This is a combination outfit which is used for both general cooking purposes and the canning of fruits, vegetables, and meats. Because of its general utility in the home it can be made of great labor-saving value to the housewife for the cooking of all kinds of meats, vegetable dinners, soups, gravies, and stews. It is considered the quickest canning outfit on the market. This is due to the facts that it is made entirely of aluminum and transmits heat very quickly, and will carry as high as 30 pounds of steam pressure. Its general make-up and necessary parts are practically the same as in other steam-pressure outfits made of steel, iron, or heavy tin.

NOTE.—The time schedule for sterilization in all of our recipes is made to accommodate the five distinct types of home canners. The homemade and hot-water commercial outfits are classed under the head of "Hot-water bath outfits." The other three are classed in the order given above and under the same names, thus making the five classes with different time requirements.

TEMPERATURE FOR BOILING WATER AT DIFFERENT ALTITUDES.

Water boils at sea level at 212° F. As the altitude increases, the temperature at which water will boil gradually decreases. The following table is intended as a guide to determine the increase of time required for the sterilization of foodstuffs in the canning process at various altitudes:

500 feet above sea level, 211° F.
1,000 feet above sea level, 210° F.
2,000 feet above sea level, 208° F.
3,000 feet above sea level, 206° F.
4,000 feet above sea level, 204+° F.
5,000 feet above sea level, 202+° F.
6,000 feet above sea level, 201° F.
7,000 feet above sea level, 199° F.

The time-table given in these instructions is based upon the first altitude given—500 feet above sea level. For every 4,000 feet increase in altitude it will be well to add 25 per cent to the time requirements given in the recipes or time schedule for the canning of all kinds of fruits, vegetables, greens, and meats. Variations from this schedule will be necessitated by extreme variations in the condition of the products to be canned.

For specific instructions in tipping and capping of tin cans, canning of windfall apples, sterilizing apple cider, making sirup from sweet cider, recipes for fruits and vegetables, send to the United States Department of Agriculture, States Relations Service, Office of Extension Work, North and West, and ask for the NR series of Home-Canning Club instructions.

CONTAINERS.

GLASS JARS.

It is conceded by most women that glass jars are the most desirable and economical for use in canning for home use, as they can be used from year to year, or indefinitely, by simply adding new rubbers and tops each year. Practically all of the various types of glass jars available on the market can be successfully used in the canning of fruits, vegetables, and meats by the "cold-pack" method outlined in these instructions.

In the handling of all glass-top jars with the top and clamp springs it is important to remember that the rubber, cap, and top spring are put in place, while the lower clamp spring is left up, or raised, during the entire period of sterilization and then lowered and completely closed after sterilization.

In handling the screw-top jar it is important to remember that the rubber and top are put in place and the top turned until it touches the rubber, sealing the jar partially, but not so closely as to prevent the escape of excessive or expanded air.

TIN CANS.

When the canning work has developed to such an extent that a considerable portion of the products will need to be sold on the general market and in competition with commercially canned food products, the tin cans are considered most practical because of their convenience in storage and handling through the various transportation channels.

When canning vegetables and meats, it is desirable to use the enameled or lacquered cans. This, however, is not necessary for all products, especially fruits, when the work is carefully supervised and the blanching, cold dipping, and general rules for handling the food products are carefully followed. Ask for United States Department of Agriculture, Office of Extension Work, North and West, Circular NR 22, on the use of tin cans, tipping, and capping.

MAKING OF BRINE AND SIRUPS.

The following table shows the proportions of salt and water required to make brines of given percentage strengths:

Table for making brines.

Salt.	Water.	Per cent.
1 pound.....	12 gallons.....	1
2 pounds.....	12 gallons.....	2
1 pound.....	4 gallons.....	3
2 pounds.....	4 gallons.....	6
2 pounds.....	3 gallons.....	8
5 pounds.....	6 gallons.....	10
5 pounds.....	4 quarts.....	15
1 pound.....	3 quarts.....	16
1 pound, 4 ounces.....	3 quarts.....	20
1 pound, 9 ounces.....	3 quarts.....	25

SUGAR SIRUPS.

Sugar sirups are made by boiling sugar and water together to a certain density. This density, expressed as "degree," or "per cent," is measured by a density gauge, and also by what is sometimes termed a "mental-finger gauge," which furnishes, of course, only an approximate estimate of the density or "concentration" of the sirups.

The following sirup table is computed on the number of pounds of sugar in 100 pounds of solution, and, therefore, is called a "per cent table":

Table for making sirups.

Sugar.	Water.	Per cent.
1 pound.....	3 quarts.....	16
1 pound, 4 ounces.....	3 quarts.....	20
1 pound, 9 ounces.....	3 quarts.....	25
2 pounds, 8 ounces.....	4 quarts.....	30
1 pound.....	1½ quarts.....	32
2 pounds, 3 ounces.....	3 quarts.....	35
2 pounds, 8 ounces.....	3 quarts.....	40
2 pounds, 13 ounces.....	3 quarts.....	45
3 pounds, 2 ounces.....	3 quarts.....	50
3 pounds, 7 ounces.....	3 quarts.....	55
3 pounds, 12 ounces.....	3 quarts.....	60

The formula much used in the West for sirup is 3 quarts of sugar to 2 quarts of water, boiled to a thin, medium-thin, medium-thick, or thick sirup. The formula sometimes called the Eastern formula is 3 quarts of water to 2 quarts of sugar, boiled to a thin, medium-thin, medium-thick, or thick sirup.

APPROXIMATE DENSITY TERMS EXPLAINED.

1. *Thin sirup* is sugar and water boiled sufficiently to dissolve all sugar; but is not sticky.
2. *Medium thin sirup* is that which has begun to thicken and becomes sticky when cooled on the finger tip or spoon.
3. *Medium thick sirup* is that which has thickened enough to roll or pile up over the edge of a spoon when you try to pour it out.
4. *Thick sirup* is that which has become so thick that it is difficult to pour out of a spoon or container (not sugared).

Thin sirups are used for all sweet fruits that are not too delicate in texture and color, such as cherries, peaches, apples, etc.

Medium-thin sirups are used in the canning of the medium-sweet fruits, such as blackberries, currants, dewberries, huckleberries, raspberries, etc.

Medium-thick sirups are used in the canning of all sour fruits, such as gooseberries, apricots, sour apples, etc., and delicately colored fruits, such as strawberries and red raspberries.

Thick sirup is used in preserving and in making all kinds of sun preserves.

USEFUL TABLES.

Weights of cans and cases.

- 1,000 No. 2 empty tin cans will weigh 212 pounds.
 1,000 No. 3 empty tin cans will weigh 310 pounds.
 1 case (wood) for 24 empty No. 2 tin cans will weigh 13 pounds.
 1 case (wood) for 24 empty No. 3 tin cans will weigh 17 pounds.

The following table will show approximately how many Nos. 2 and 3 cans can be filled from a bushel of various fruits and vegetables:

Number of cans per bushel of various fruits and vegetables.

Product.	No. 2 cans (pints).	No. 3 cans (quarts).	Product.	No. 2 cans (pints).	No. 3 cans (quarts).
1 bushel windfall apples.....	30	20	1 bushel tomatoes.....	22	15
1 bushel standard peaches.....	25	18	1 bushel shelled lima beans....	50	30
1 bushel pears.....	45	30	1 bushel string beans.....	30	20
1 bushel plums.....	45	30	1 bushel sweet corn.....	45	25
1 bushel blackberries.....	50	30	1 bushel shelled peas.....	16	10
1 bushel windfall oranges (sliced).....	22	15	1 bushel sweet potatoes.....	30	20
1 bushel windfall oranges (whole).....	35	22			

IMPORTANT CANNING SUGGESTIONS.

FACTS FOR HOME CANNING.

Do not combine two recipes or two sets of instructions in canning. If you do, you will fail.

Remember that efficient heat, plenty of clean water, and complete sterilization are absolutely necessary.

The "cold-pack" method of canning does not mean that the canning is done without heat, but simply means that the final sterilization is done after the jar or can has been completely filled, the rubber and cap put in place, or the tin can completely sealed.

When using glass jars always utilize the jars you have on hand, but when you buy new jars, buy the best. They are the cheapest in the long run. No glass jar with metal or rubber in direct contact with the food product is desirable unless the cap is enameled, lacquered, or vulcanized. Glass jars should be thoroughly cleaned and should be taken directly from hot water to be filled.

When coring, peeling, and slicing apples, the apple product should be dropped in a vessel containing cold, slightly salted water, in order to keep the product from discoloring before packing.

Canned products in glass jars, if exposed to light, will bleach, fade, and sometimes deteriorate in food value; hence the necessity of wrapping in paper.

If vegetables and greens are blanched in a steamer and then plunged into cold water, it is perfectly safe to use tin cans; however, enameled or lacquered cans are always the safest.

Do not can rhubarb in tin cans unless you use at least 30° density sirup and enameled cans.

Products canned in tin should be emptied into glass, porcelain, china, or stoneware as soon as the can is opened. Pack jars and tin cans thoroughly, but avoid overpacking tin cans with products such as corn, peas, and lima beans, as all of these expand somewhat during sterilization.

Avoid using too much salt in the canning of vegetables, greens, tomatoes, and sweet corn. A little sugar added before sterilization will improve the product and sometimes shorten the time required for processing.

Avoid destroying the vegetable or volatile oils in products such as greens, cabbage, brussels sprouts, and cauliflower when canning, but be sure to eliminate the excessive acids. This is done by blanching the product in a steamer or large dishpan (over a false bottom), with just a little water beneath the greens.

When canning windfall apples whole, sliced, or quartered, remember that they must be sterilized enough to keep, but avoid overcooking to reduce to apple sauce or tarnish color of pulp.

Enough, convenient, and efficient canning equipment is important to success. When using steam-pressure outfits, remember that too much pressure is destructive to the value of all food products.

Begin your canning work with a small quantity and with one product the first day. Take time to do your work well, then test the products before you can a large quantity.

Standardize your products, and if you are to market your canned goods protect your standard and your trade-mark faithfully from year to year, through a uniform and reliable product as well as pack.

In many instances it is important that you work or can with a homemade outfit first, then you will be in better position to determine what kind of commercial outfit you can best use in your work. The fact that an outfit is called a home-canning outfit and is very favorably advertised, and that the company promises much, does not necessarily mean that it is the kind of outfit you should buy. Investigate carefully before you buy. No commercial canner has been selected or recommended by the Department of Agriculture as the only reliable device. Buy an outfit that will do your canning by the one-period method—one that will lessen your labors, save your time, and increase your efficiency. An outfit which requires increased time and labor should be avoided.

Business organization and management is nowhere more important than in canning operations. The proper placing of tables with relation to canner, water, fuel, and source of vegetables and fruits, the arrangement of utensils, and the system with which the canning work is executed are all vital matters.

Prepared by

O. V. Benson

In Charge of Boys' and Girls' Club Work, North and West.

Approved:

C. B. SMITH,

Chief, Office of Extension Work, North and West.

COOPERATIVE EXTENSION WORK IN AGRICULTURAL AND HOME ECONOMICS.

STATE AGRICULTURAL COLLEGE AND
UNITED STATES DEPARTMENT OF AGRICULTURE,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

MOTHER-DAUGHTER HOME CANNING CLUB AND VACATION CANNING CLUB.

PROJECT REPORT.

TO CLUB MEMBER:

This blank form is sent to all the members of the Mother-Daughter and the Vacation Home Canning Clubs, in order to secure uniform and carefully attested reports on the results of the club work for the season, and at the same time furnish definite instructions on how to keep records of observations, receipts, and expenditures in connection with this project and its management.

Keep an accurate record of your home canning work as you proceed, being careful to include all items of management and expense, as well as your receipts from the sale of fresh and canned products, and then fill out this report, in full, and mail it to your local leader or county superintendent of schools, who will transmit the same to the State agent in charge of club work, whose name is signed in the right-hand corner below.

If there is no State agent, mail the report direct to the Office of Extension Work, North and West, States Relations Service, U. S. Department of Agriculture, Washington, D. C., not later than December 1.

Very truly, yours,

*State Agent in Charge of Club Work,
United States Department of Agriculture.*

Prepared by—

GEORGE E. FARRELL,
*Assistant, Club Work,
Northern and Western States.*

Approved by—

C. B. SMITH,
*Chief, Office of Extension Work,
North and West*

CLUB MEMBER: Please fill out the following report blank, in full, from your daily records of Home Canning Club work for the past season. The blank transmitted early in the spring is intended as a guide and is for you to keep. The blank sent to you in the fall is for your final report.

ESTIMATE OF COSTS.

Estimate the cost of fruit and vegetables secured from the home orchard and garden at actual cost of production (rent of land, cost of preparation, seed, labor, plants, etc.). Estimate the time of mother and daughter combined at 25 cents per hour. Estimate all other things, such as sugar, salt, jars, cans, etc., at actual cost. When using this blank for the Vacation Canning Club work, estimate the time of members below the age of 18 at 10 cents per hour and those above the age of 18 at 15 cents per hour.

COST OF ALL CANNING.

1. Fruits secured in home orchard .....	\$ .....	.....
2. Vegetables raised in home garden .....	.....	.....
3. Fruits purchased for canning .....	.....	.....
4. Vegetables purchased for canning .....	.....	.....
5. Mother's and daughter's time, hours, at 25 cents per hour .....	.....	.....
6. pounds of sugar, at cents per pound .....	.....	.....
7. pounds of salt, at cents per pound .....	.....	.....
8. Glass jars (charge one-fifth value to each year's work) .....	.....	.....
9. Rubbers, lids, flux, solder, coring knives, etc .....	.....	.....
10. Tin cans and lids, No. 2, No. 3, No. 10 .....	.....	.....
11. Total cost of canning outfit, \$..... (Charge one-fifth cost to each year's work) .....	.....	.....
12. Fuel (estimated) .....	.....	.....
Total cost of production .....	.....	.....

RECEIPTS.

(Estimate the value of products canned at the price it would cost to secure them on the market.)

1. pints fruit, glass jars, at cents .....	\$ .....	.....
2. quarts fruit, glass jars, at cents .....	.....	.....
3. half-gallon glass jars of fruit, at cents .....	.....	.....
4. No. 2 tin cans of fruit, at cents .....	.....	.....
5. No. 3 tin cans of fruit, at cents .....	.....	.....
6. No. 10 tin cans of fruit, at cents .....	.....	.....
Total quarts of fruit canned .....	.....	.....
(Estimate No. 2 cans as pints, No. 3 as quarts, No. 10 as gallons.)		
7. pints vegetables, glass jars, at cents .....	.....	.....
8. quarts vegetables, glass jars, at cents .....	.....	.....
9. half-gallon glass jars vegetables, at cents .....	.....	.....

10.	No. 2 tin cans of vegetables at	cents.....	\$.....	.....
11.	No. 3 tin cans of vegetables at	cents.....	.....	.....
12.	No. 10 tin cans of vegetables at	cents.....	.....	.....
	Total quarts of vegetables canned.....			
13.	pints jams, jellies, fruit butters, etc., at	cents.....	.....	.....
14.	pints soup, soup stock, and mixed vegetables at	cents.....	.....	.....
	(Use these lines to list other things canned or preserved.)			
15. ....	.....		
16. ....	.....		
17. ....	.....		
	Total value of products.....		.....	.....
	Net profit.....		.....	.....
	(Subtract cost of production from value of products.)			

SPECIAL REPORT.

DAUGHTER'S REPORT.

.....		
(Name.)		(Age.)		(Date.)	
.....		
(P. O. Address.)		(R. F. D.)		(County.) (State.)	

1. Did you do any canning last year?
2. Did you do any club work last year?
3. Have you assisted in any public canning demonstrations?
4. Where?
5. Did you interest and help any of your friends or club members in the canning work?
- How many?
6. What kind of stove did you use for canning?
7. What kind of jars did you use?
8. What type of canner did you use? (Hot-water-bath, water-seal, or steam-pressure.)
-
9. Largest number of quarts canned in a single day
10. Total number of quarts of fruits marketed this year
11. Total number of quarts of vegetables marketed this year
12. Total number of quarts of jams, jellies, and preserves marketed
13. Total number of quarts of soups, purées, consommés marketed
14. How many more quarts of fruit put up in home this year than last?
15. How many more quarts of vegetables put up this year than last?
16. How many more pints of jams, jellies, fruit butters, etc., put up this year than last?
17. How many more quarts of canned fruit marketed this year than last?
18. How many more quarts of canned vegetables marketed this year than last?

MOTHER'S REPORT.

- (Name.) ----- (Date.) -----
1. Method used? (Open-kettle, fractional, or cold-pack—Club recipes are for cold-pack method) -----
 2. Tell how the Canning Club work has helped you in your home -----
 3. Has the club work interested your daughter in the home? -----
 4. Has the labor of the canning season been lightened and made more interesting? -----
 5. What prizes did you win at local, county, or State fair? -----
Self ----- Both -----
 6. Have you assisted your neighbors in any way to can surplus food products? -----
How many? -----

SUMMARY OF MOTHER-DAUGHTER CLUB WORK.

- | | |
|--|----------|
| 1. Total number quarts of fruit canned ----- | ----- |
| (Estimate No. 2 cans as pints, No. 3 as quarts, No. 10 as gallons.) | |
| 2. Total cost of fruit, fuel, sugar, jars, cans, labor, etc ----- | \$ ----- |
| 3. Average cost of fruit per quart ----- | ----- |
| (Divide answer No. 2 by answer No. 1.) | |
| 4. Total number of quarts of vegetables canned ----- | ----- |
| 5. Total cost of vegetables, fuel, salt, jars, cans, labor, etc ----- | ----- |
| 6. Average cost of vegetables per quart ----- | ----- |
| (Divide answer No. 5 by answer No. 4.) | |
| 7. Total number of pints of jams, jellies, fruit butters, etc ----- | ----- |
| 8. Total cost of production for jams, jellies, fruit butter, etc ----- | ----- |
| 9. Average cost of jams, jellies, fruit butters, etc., per pint ----- | ----- |
| (Divide answer No. 7 by answer No. 8.) | |
| 10. Total pints soups, purées, and consommés canned ----- | ----- |
| 11. Total cost of production; vegetables, fuel, meats, etc ----- | ----- |
| 12. Average cost per pint ----- | ----- |
| (Divide answer No. 12 by answer No. 11.) | |

CERTIFICATE.

I hereby certify that this is a complete and correct report in every particular, and that we have answered all questions to the best of our ability.

(Mother's signature.)

(Daughter's signature.)

STATEMENT BY COMMITTEE.

We hereby certify that we have checked this report and investigated the products canned and find the report correct. We also certify that we are not relatives of the club members.

-----, -----, -----, -----
 (Date.) (Name.) (Address.) (Occupation.)

-----, -----, -----, -----
 (Date.) (Name.) (Address.) (Occupation.)

STORY—"MOTHER AND I AT HOME CANNING."

INSTRUCTIONS TO DAUGHTER.

Write carefully, with pen and ink, in your own language, the story of your club work. Observe carefully the proper use of capitals and punctuation. Make your story tell of your interesting experiences in connection with your work. If it is well written and interesting, it may be sent to the public press. Tell the interesting things about the work of both yourself and mother in your planning and experiences in home canning.

SUGGESTIVE OUTLINE FOR STORY.

The following outline is suggestive. You may have other interesting material that you will want to add. Make your story interesting.

1. Why we joined the canning club.
2. How we did our canning in former years.
3. How we planned to save time and labor this year.
4. Did father, hired men, or brothers become interested, and how did they assist you?
5. Tell the interesting incidents of your canning work.
6. Tell about the local exhibit of your club.
7. Tell about the interesting exhibits that you made at county or State fairs.
8. Tell about the difficulties that you overcame.
9. Tell how and where you stored your canned fruit and vegetables.
10. Tell how you graded products before canning and the number of grades.
11. Tell how and where you marketed your products.
12. Tell what kind and how much of your canned goods you will use on an average per day in your home.
13. Tell how it benefited you and mother.
14. Demonstrations I have given.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK AND EXTENSION WORK WITH FARM WOMEN.

THE MOTHER-DAUGHTER HOME CANNING CLUB.

By O. H. BENSON, *In Charge of Boys' and Girls' Club Work in the Northern and Western States.*

The principal objects of the mother-daughter home canning club work are (1) to bring about a closer fellowship between mother and daughter in the social and economic activities in the home, and (2) to preserve food by canning, and thus save waste, reduce living expenses,



FIG. 1.—School of instruction for training of mothers and daughters in methods of home canning.

and improve the family diet. The beneficial effects of such work are by no means confined to the home, but in many cases are felt in the social life and activities of the community at large.

The main purpose of this circular is to suggest ways in which mother-daughter clubs may be efficiently organized and conducted.

THE PLAN.

The plan for a mother-daughter home canning club should provide for work covering four years, but the work of each year should include canning as the primary activity of the club members. During the first year canning should occupy the larger portion of attention and

include the attendance at demonstrations of canning, the study of canning literature with home work in canning fruits and vegetables at first, followed later by the canning of soups and meats. The regular club meetings should be held, as well as a club fair and a club achievement day, suggestive programs for which are given later in this circular. The work of the second year should continue the work of the first year, with additional attention given to cooking lessons. The work of the third year should continue that of the two preceding years, with additional lessons on canning, cooking, and sewing. The work of the four years should be planned to cover four definite home-interest subjects, such as home canning, cooking, sewing, and care and arrangement of the kitchen.

It frequently happens that a perishable product becomes available unexpectedly or in larger quantities than was expected. The mother-daughter home canning club can handle this situation by cooperative effort whereby two or more teams meet at a convenient place, and through the united effort economically handle the product which could not be properly cared for by one team working alone. Provisions for such cooperative canning should be included in the outline of work for each year.

MEMBERSHIP REQUIREMENTS.

Membership in a mother-daughter home canning club should be made by teams, each team consisting of a senior and a junior member, the senior members to be women 18 years of age or over and junior members girls from 10 to 18 years of age. It is expected that the members of the club will attend its regular meetings, and failure to attend meetings without a reasonable excuse is usually regarded as a sufficient cause for forfeiting membership in the club. As the primary object of the club is home canning of fruits and vegetables the members are expected to attend canning demonstrations (fig. 1) and to read the canning instructions furnished them by the State leader of club work. In order to secure successful results in canning and also to have a uniform product when it is desired to sell canned goods, members should agree to follow the instructions furnished for canning. Since the usual basis of award and programs at club fairs and festivals (see p. 5) require that the exhibit be accompanied by a record of the work done and a story of the way in which members did the work, it is very desirable that members keep accurate records throughout the season. Moreover, if members keep a simple system of cost accounting as well as canning records they will probably have a better appreciation of the business management of the home.

ORGANIZATION.

When interest is manifested in the organization of a mother-daughter home canning club the State leaders in boys' and girls' club work and extension workers in home economics should be consulted and their cooperation secured. They should be asked to furnish specific outlines for local club work, suggestive programs for club meetings, and follow-up instructions.

The constitutions used in different States vary somewhat, but the following form, adapted from one used by Otis E. Hall, State club leader of Kansas, in the work in that State contains the principal features needed by the mother-daughter home canning club:

SUGGESTIVE CONSTITUTION FOR A MOTHER-DAUGHTER HOME CANNING CLUB.

ARTICLE I (NAME).

The name of this organization shall be the ——— Mother-Daughter Home Canning Club, of ——— County, ———.

ARTICLE II (PURPOSE).

The purpose of this organization shall be to teach and encourage the home canning of those food products which are generally plentiful in summer but scarce in winter, and to bring about a closer friendship and cooperative spirit in rural and village communities.

ARTICLE III.

SEC. 1. Membership. Membership in this club shall be made by teams. Each team shall consist of a senior and a junior member. Senior membership shall consist of women over 18 years of age and junior membership shall consist of girls from 10 to 18 years of age.

SEC. 2. New membership. After a club is properly organized, additional members shall be admitted only by a two-thirds vote of the club.

SEC. 3. Forfeit of membership. A failure to attend three successive meetings without a reasonable excuse shall be sufficient cause for the forfeiting of membership in the club. Also a failure to comply with the rules and by-laws of the club after due notice in writing from the secretary shall be cause for the forfeiting of membership.

ARTICLE IV (ORGANIZATION AND OFFICERS).

(No club shall be organized with less than five teams.)

SEC. 1. The officers shall consist of a president, a vice president, a secretary, and a treasurer. The duties of these officers shall be those that usually devolve upon such officers in other organizations of like character. The president, for example, shall be the executive head of the club and shall appoint all committees and shall be ex officio member of all committees appointed. The committees shall consist of (1) a program committee, (2) a social committee, (3) a new membership committee, (4) a buying and selling committee, and (5) a community welfare committee.

SEC. 2. The election of officers. The officers of this club shall be elected annually, and only active members shall be eligible to hold office, and only those members in good standing shall be eligible to vote for officers or on other business propositions. All voting for officers shall be by ballot unless otherwise ordered by the club. Before any candidate can be declared elected she must receive a majority of all votes cast.

SEC. 3. Two of the four officers shall consist of junior members and two of senior members; in so far as possible, one-half of the personnel of all committees shall be of the junior members.

SEC. 4. The right to vote shall be given to all junior as well as senior members.

The membership of committees shall also be divided as equally as possible between the junior and senior members.

ARTICLE V (MEETINGS).

SEC. 1. There shall be, so far as practicable, a regular meeting of the whole club every two weeks or each month, and special meetings shall be held subject to the call of the president. The program of the regular meetings shall proceed as follows: First, regular order of business; second, a subject-matter program or an actual canning demonstration by some one from the college or by one or more teams from the club, or a practical and helpful discussion on some definite phase of the canning problem; and third, social session or adjournment.

Special meetings shall be subject to the call of the president, and when a two-thirds majority of the membership of the club is present business may be transacted the same as at any regular meeting.

SEC. 2. The order of business shall be as follows:

1. Call to order by the president or vice president.
2. Reading of minutes of last meeting by the secretary.
3. Reports from standing or special committees.
4. Unfinished business.
5. New business.
6. Social program.

ARTICLE VI (DUTIES OF CLUB MEMBERS).

Every member is to carry out the rules of the club, which rules shall be prepared or approved by the club leader. Each member shall also make a final exhibit for the club if the making of such exhibit is voted for by a majority of the members of the club.

CLUB MEETINGS.

In as far as possible club meetings should be conducted at times most convenient for the members to attend. In most communities two meetings per month are usually conducted afternoons.

Detailed suggestions for local club programs may be secured from the State club leader. The programs used in many States include many of the suggestions which follow.

SUGGESTIVE PROGRAMS FOR CLUB MEETINGS.

The program may profitably be divided into three sections: (1) A business program, (2) subject-matter program, and (3) a social program.

FIRST MEETING.

- (1) A business meeting lasting not more than 20 minutes. This may be opened by a roll-call to be answered by a report from each member present of the number of jars of foodstuffs canned
- (2) Subject-matter program.
 - Report of progress by members in the work.
 - Discussions by members on—
 - Methods in canning.
 - How to make an inexpensive homemade canner.
 - Best fruits and vegetables for the diet.
 - Demonstrations by mother-daughter team on how to can strawberries.



FIG. 2.—A Mother-Daughter Canning Demonstration Team—as they appear in action before the friends and neighbors of the community.

(3) Social program.

This should be furnished by the social committee and should provide for a free and informal discussion on community interests, school problems, current events, and perhaps for the playing of a few games in which both mothers and daughters may participate with interest. This program should offer some versatility in order to keep up interest on the part of both mothers and daughters.

SECOND MEETING.

- (1) Business meeting lasting not more than 20 minutes. This may be opened by a roll-call to be answered by each member quoting a recipe from instructions furnished.
- (2) Subject-matter program.
 - Demonstrate how to can hard fruits (apples), by mother-daughter team. (Fig. 2.)
 - Demonstrate how to make a homemade canner, by mother-daughter team.
 - Demonstrate how to can dandelion greens, by mother-daughter team.
 - Demonstrate how to prepare and serve vegetable greens, by mother-daughter team.
- (3) Social program.
 - Suggestions given for the first program may be followed.
 - It is usually desirable to have selections of music. A few stories and nursery rhymes to demonstrate the telling of stories to little children will be valuable as a part of the social program and will be desirable in the training of the mothers and daughters for their home responsibilities.

OTHER MEETINGS.

In a similar way, programs may be outlined for the entire calendar year, covering monthly, semimonthly, or weekly meetings. Play festivals, socials, fairs, harvest-home and fall festivals, educational excursions to gardens, orchards, and kitchens in the neighborhood should be planned. The boys and fathers should be invited to a number of meetings during the year and given a chance to become interested in the entire program of the mother-daughter club. The club may some time during the year give a banquet to the husbands, brothers, and male friends.

BASIS OF AWARD.

The following basis of award is frequently used as a guide by judges and referees in awarding prizes, honors, and determining achievement credit for club work done:

	Per cent.
1. Quantity or variety of canned products.....	20
2. Quality of canned products.....	20
3. Appearance of canned products.....	20
4. Profit on investment.....	20
5. Records or stories of home canning work.....	20
Total score.....	100

PRIZES AND MEDALS.

It is expected that the entire club will work to win honor and reputation for the community and that the mother-daughter team will constitute the unit upon which the standards of achievement are to be measured. At the club festivals, county, district, and State fairs it is suggested that prizes be given for the exhibits of the mother-daughter team or the entire club. If a prize is given for an exhibit of canned goods, this prize should be won by the mother and daughter team and owned jointly by the mother and daughter.

CLUB FAIR AND FESTIVAL.

The interest in the club and knowledge of its work will be greatly increased by holding a fair and festival in the early part of the season and another at the close of the season. A suggestive program given below will give an idea of the arrangement of subjects which may be taken up at these two public meetings.

JULY FAIR AND FESTIVAL.

- (1) Parade; mother-daughter club in uniforms.
- (2) Club demonstration of home canning methods.
- (3) Home-canned luncheon or picnic dinner.
- (4) Club play contests:
 - (a) Apple-paring contest.
 - (b) Variety-naming contest.
 - (c) Needle-threading contest.
 - (d) Vegetable and fruit judging contests.
 - (e) Can labeling, recipe giving, and other games and contests may be used.
- (5) Awarding of prizes and honors.
- (6) Report by officers.

OCTOBER FAIR AND FESTIVAL.

- (1) Music, Mrs. Darwin and daughter.
- (2) Mother-daughter club as a community builder, Rev. J. Brown.
- (3) Report of club president on achievement of the club, Mrs. Anna Brown.
- (4) Report of team work:
 - Mrs. Smith and daughter.
 - Mrs. Franklin and daughter.
 - Mrs. Fairbanks and daughter.
- (5) Report of committee on awards.
- (6) Awarding achievement medals by county demonstrator, county or State club leader.

ACCOMPLISHMENT OF ONE MOTHER-DAUGHTER CLUB.

The Glenwood Mother-Daughter Club of Leavenworth County, Kans., was the first one organized in the United States, and in the two years of its existence has made a remarkable record of achievement, as the following statement based on information furnished by the Kansas State leader in charge of boys' and girls' club work indicates:

There were 29 mother-daughter teams, or 58 members, in the club in 1916. The youngest daughter in the club was 9 years of age, the oldest 17. This club held its meetings every two weeks in the local rural church. The membership of the club represents a typical farming community, 10 miles square. During the canning season this club of 58 members achieved remarkable success in home canning and in other activities for community development. Here are a few items of interest about this work. The entire club put up 9,838 quarts of food products, consisting of 4,520 quarts of fruit, 4,117½ quarts of vegetables, 84½ quarts of soup; 183½ quarts of meat; 932½ quarts of jellies, jams, and preserves. The average cost per quart of all food products canned by this club was 14 cents; the average profit per quart of all canned food products was 24 cents. Eleven of the mother-daughter teams of this club canned over 100 varieties of food products, two mother-daughter teams canning over 200 varieties, representing all kinds of fruits, vegetables, soups, and meats (pork, beef, poultry, both wild and domestic fowl, squirrel, 'possum, coon, rabbit, fish, oysters, etc.). The total value of food products canned by this club was \$3,840.46. The club made a net profit of \$2,462.24, and canned 1,807 quarts of food products more than the same club canned in 1915, its first year of work.



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

STATE AGRICULTURAL COLLEGE AND
U. S. DEPARTMENT OF AGRICULTURE
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

APPLE CLUB PROJECT.

CROP REPORT.

To Club Member:

This blank form is sent to all the membership of the Apple Club project in order to secure uniform and carefully attested reports on the results of the club work for the season and at the same time furnish definite instructions on how to keep records of observations, receipts, and expenditures in connection with a crop and its management.

Keep an accurate record of your Apple Club work as you proceed, being careful to include all items of management and expense, as well as your receipts from both fresh and canned products, and then fill out this report in full and mail to your local leader, who will transmit the same to the State agent in charge of club work.

If you have no State agent, you should mail the report direct to the States Relations Service, Office of Extension Work, North and West, United States Department of Agriculture, not later than December 1.

Very truly yours,

*State Agent in Charge,
U. S. Department of Agriculture.*

Prepared by—

GEORGE E. FARRELL,

Assistant in Club Work, North and West.

Approved:

C. B. SMITH,

Chief, Office of Extension Work, North and West.

Please fill out the following report blank in full from your daily records of Apple Club work for the past season. The blank transmitted in early spring is intended as a guide and for your use in keeping records during the season. The blank furnished you in the fall is for your final report.

ESTIMATE OF COSTS.

NOTE.—Estimate cost of your club plat as follows: Rental of land or trees at actual cost or as recommended by State or district leader; count your own time at 10 cents an hour; if adult labor is employed or parents assist, count time at actual cost or 15 cents an hour; all commercial fertilizers, team work, and other hired help at actual cost, and barnyard manure at \$2 per ton (estimate a good two-horse load as a ton and a one-horse load as one-half ton). Estimate commercial fertilizers at cost.

COST OF PRODUCTION.

1. Rent of land or trees (see above) .....	\$ .....	.....
2. Cultivation of orchard (cost of labor, etc.) .....	.....	.....
3. Cost of pruning and thinning .....	.....	.....
4. Cost of spraying (labor in doing work) .....	.....	.....
5. Cost of spraying mixtures .....	.....	.....
6. Cost of manure and commercial fertilizers (see above) .....	.....	.....
7. Cost of gathering fruit, etc .....	.....	.....
8. Cost of crates, cans, glass jars, labels, and supplies .....	.....	.....
9. Actual cost of canning work .....	.....	.....
10. Total cost of spraying outfit \$..... (charge one-fifth of cost to this year's crop) .....	.....	.....
11. Cost of marketing fresh and canned apple products .....	.....	.....
12. Total cost .....	.....	.....

APPLE RECEIPTS.

13. Receipts from fresh apples sold .....	\$ .....	.....
14. Receipts from canned apples sold .....	.....	.....
15. Value of apples for home use, both fresh and canned .....	.....	.....
16. Receipts from other apple products, as sirup, cider, and vinegar .....	.....	.....
(Estimate based on value to you if you sell to local market.)		
17. Total value of all products (add above four items) .....	.....	.....
18. Subtract total cost (see No. 12 above) .....	.....	.....
19. Net profit for year on Apple Club work .....	.....	.....
20. (a) Net cost per box, \$..... (b) Net cost per barrel, \$.....	.....	.....
(c) Net cost per bushel, \$..... (d) Cost per gallon canned, \$.....	.....	.....
(e) Net cost per gallon of cider, \$..... (f) Net cost per gallon of sirup, \$.....	.....	.....

SPECIAL CROP REPORT.

8-3204

Report of _____, 191
(Name of member.) (Age.) (Date.)

- (P. O. address.) (R. D.) (County.) (State.)
1. Size of orchard operated under club project instructions _____ No. of trees _____
(Give square rods or acres.)
 2. Kind and depth of top soil _____
 3. Kind of subsoil (clay, lime, stone, lava ash, etc.) _____
 4. (a) Kind or variety of apples _____ (b) Age of trees _____
 5. When and how was the orchard cultivated? _____
 6. Kind and quantity of fertilizer used on plat, (a) manure _____, (b) commercial _____
(Amount, analysis.)
 7. Date of pruning _____ Date of thinning _____
 8. Condition of trees when work began _____
 9. Dates of spraying _____
 10. Spray used (give formula) _____
 11. Width between rows _____ feet; distance apart in the row _____ feet.
 12. (a) How often did you cultivate? _____ (b) Kind of tools? _____
 13. State here any trouble you may have had with plant diseases, insects, accidents, etc _____
 14. What use did you make of culls and windfalls? _____
 15. Number of gallons of cider made _____ Number of gallons of sirup made _____
 16. Number of gallons of apples canned in glass _____ 17. In tin _____
 18. Date of first bloom _____ 19. Date of first maturity, marketable fruit _____
 20. Date of sale of first fruit _____ 21. Date of harvesting last fruit _____
 22. How much of your product did you keep for home use? _____
 23. Did you grade and crate you fruit for the market? _____
 24. How many boxes of apples did you harvest? _____; barrels? _____; bushels? _____
 25. How many bushels of culls and windfalls did you utilize? _____
 26. How many boxes did you market by parcel post? _____
 27. Who visited your orchard during season? _____
(State whether teacher, county superintendent, friends, county or State agents.)
 28. Where did you exhibit your products? _____ When? _____
 29. What prizes did you win? _____ Value _____
 30. Will you continue to be a club member for next year? _____
 31. Tell other points of interest about your work _____
 32. Did you use the 4-H brand labels? _____ How many? _____

STATE

COUNTY

IMPORTANT SUGGESTIONS TO CLUB MEMBERS.

Two disinterested persons who are not relatives of the club member should be selected as witnesses of both the dimensions of the Apple Club plat and its yield. Compare carefully with this report.

Allow one-half the width of the rows on each of the four sides of the rows. Give the length of plat here: feet. Give the width of the plat here: feet. Number of trees

Give the total number of boxes, barrels, or bushels of apples harvested here:

Reduce all products canned in glass or tin to gallons. Give total number here: gallons.
Give total number of gallons of sirup here: gallons.

Total bushels of cull or windfall apples sold, bushels.

CERTIFICATE.

I HEREBY CERTIFY that this crop report is complete and correct in every particular, and that I have answered all questions to the best of my ability and understanding.

Signed by

.....
Club Member.

STATEMENT BY COMMITTEE.

WE HEREBY CERTIFY that we have carefully inspected this report, measured the apple plat, and investigated the yield in both fresh and canned products, and find the items referred to in this report to be correct. We also certify that we are not relatives of the club member.

Signed:

Date, (Name.), (Occupation.)

Date, (Name.), (Occupation.)

HOW I MADE MY CROP.

8-3204

INSTRUCTIONS.—Follow carefully your crop report and tell the story in your own language of how you made your crop. Write with pen and ink; observe carefully the proper use of capitals and paragraphing. Tell all interesting experiences you have had in managing your orchard which are not mentioned elsewhere in this report. If your story is well written and interesting it may be sent to the public press.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

HOW I MADE MY CROP—CONTINUED.

8—3204

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A series of horizontal dashed lines for writing.

A series of horizontal dashed lines for writing.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, SOUTH, WASHING-
TON, D. C.

CANNING.

SEPTEMBER 1, 1915.

TO CANNING CLUB MEMBERS IN THE SOUTH:

It is important that you get ready for the canning season by securing in advance supplies such as jars, cans with solder hemmed caps, canning outfit, etc., so that you will allow nothing to go to waste. It is also of the greatest importance that you study your instructions and follow the advice of your county agent carefully that your products may be of fine quality. Club members must follow these instructions for canning so that all products may be uniform and of standard pack. Tack these rules up by you as you work and observe every one of them. Remember that the "4H- Brand" label can be used only on the best and that every can you pack must come up to these standards if sold. By so doing you can secure a good market and sustain your reputation for fine products.

The United States Food and Drugs Act requires that foods in package form which are shipped from one State to another should have the quantity of the contents plainly and conspicuously marked. This applies to canned fruits and vegetables, in which case the net weight should be stated in pounds and ounces. Many States have similar requirements. It is illegal to sell a package containing less than the net weight stated on the label.

The directions in this circular enable you not only to comply with Federal regulations but also to produce the quality required for standard club products.

PREPARATION FOR CANNING IN TIN.

Making flux.—Put some commercial hydrochloric (muriatic) acid in a glass or crockery vessel (not metal), add strips of sheet zinc until no more can be dissolved. To this add an equal quantity of water. Label this "Flux" and use carefully. When canning have one vessel (a can will do) with enough flux in it to clean the tools. Keep separately, in a glass bottle, the quantity to be used in sealing cans.

Cleaning and tinning the steel and copper.—It is of first importance to have capping steel and tipping copper in good condition. These may need to be rubbed with coarse sandpaper or on a soft brick to smooth them, or may have to be filed to take the rust off. In the latter case care must be taken to keep the edge of the steel true. Both the capping steel and tipping copper must be kept tinned or coated with solder to make the solder flow evenly when sealing. Have ready in a can a handful of sal ammoniac mixed with a few pieces of solder. Heat the already smoothed capping steel or tipping copper until almost red hot, dip into the flux, then into the sal ammoniac and solder, turning it about and rubbing until bright and well coated with solder. Then dip into the flux again.

Preparation of vegetables.—In securing a fine quality, much depends upon having the vegetables or fruit absolutely fresh, crisp, and clean, and kept cool. Have all surroundings and utensils spotlessly clean, and carry on all steps from beginning to end of any lot of canning as rapidly as possible. A good slogan is "one hour from the field to the can." First have cans

and lids thoroughly washed and scalded. Sort and grade fruit, discarding all defective ones, and use together those of same size. Use only uniformly well ripened products. In canning, the flavor is retained only when young, tender, quickly grown vegetables are used.

STEPS TAKEN IN CANNING IN TIN.

1. *Sorting* and grading fruit or vegetables, washing, peeling, etc.
2. *Scalding, peeling, and coring (for tomatoes)*.—Put into trays and lower into boiling water for one minute. Remove at once to prevent cooking. Plunge into cold water to make the fruit firm, and peel promptly. In tomato peeling use a slender pointed knife to cut out the core and be careful not to cut into the seed cells. Keep the tomatoes whole when possible.
3. *Blanching* consists of plunging the vegetable or fruit into boiling water for a short time. Use a wire basket or cheese cloth square for this. The blanch gives a more thorough cleaning, removes the strong odor and flavor from certain kinds of vegetables, improves the texture and gives a clearer liquor. It also shrinks the fruit or vegetable and makes it more flexible. A full pack is then more easily made. The time required for blanching varies with the state of maturity. Beans should be blanched until tender enough to bend without breaking. Peaches will pack better if blanched for an instant in water below boiling (about 180° F.) lowering peaches into it for 15 seconds. The same blanch will make the hard varieties of pears pack better and give them a more transparent appearance; and used for cherries will prevent splitting and cracking. Spraying fruit with cold water after blanching will make it firmer. Frequently it is well to put the vegetable into cold water for an instant after blanching to make more crisp. In blanching asparagus, tie a few stalks in each bundle, lower bundle into water, tips up, blanching the lower ends one or two minutes before immersing the tips. Blanch the tips only two or three minutes.
4. *Packing* (see table for size of cans to use for different vegetables).—The Federal laws require the cans to be filled as full of food as is practicable for processing and to contain only enough liquor to fill the spaces and cover the contents. Weigh a sufficient number of cans before and after filling to obtain an accurate idea of average net weight. On account of expansion in processing, corn can be packed less full than other vegetables. These instructions do not cover the canning of corn for market. Mark cans with pencil or knife to show contents. Plan in advance and work rapidly. Let one person do packing and another attend to the weighing. Do not allow filled cans to stand before adding liquor and exhausting. To do so will injure the product.
5. *Adding brine, sirup, or water*.—After adding to within $\frac{1}{4}$ inch of top, shake can gently to displace all air within the can. Now clean and wipe the groove around the opening. Slip on cap and *weigh* before sealing to be sure of having required weight.
6. *Fluxing and capping*.—Apply the flux carefully around the groove, allowing none of it to enter the can. Use a small brush, cord, or little mop made by tying a piece of clean white cloth around the end of a small stick. The flux is used to make the solder adhere to the tin. Apply the clean, hot capping steel, holding the cap in place with the center rod; while you lower the steel, turn it steadily until the solder flows. Hold the rod firmly and lift the steel with a sudden twist to swing the melted solder around the groove evenly.
7. *Exhausting*.—Place the cans in trays and lower into boiling water to within 1 inch of the top to drive the air out of the cans. Let them stay the shortest time possible to drive out the air. Ordinarily three minutes is enough, and the temperature need not again reach boiling before cans are taken out. Frequently, exhausting is done at 180° F. Exhausting is necessary. If omitted, the air left in the can expands, causing it to bulge. The can may not resume normal shape again, or if it does and is exposed to a warmer temperature, it may again expand, giving the appearance of a "swell." This will prevent sale not only of that can but may also cut off

future orders. Furthermore, the presence of air may cause the tin to dissolve more readily and enter into the food. Exhausting is required where the 4-H Brand label is used.

8. *Tipping*.—Close the small hole in top of can immediately after exhausting. Apply flux as for capping, and use a little wire solder. Hold the solder with left hand near the hole and barely touch the hot copper to it so that only a bead will drop and cover the hole. This makes a neat tip.

9. *Processing*.—Boil the cans which have been exhausted and tipped to sterilize the contents. Have the water boiling vigorously when the cans go in. Lower cans slowly under the water and look out for any showers of bubbles from a can. This shows that it leaks at the point from which the bubbles come and must be taken out and resoldered. Begin counting time when the water first boils after immersing the cans. Keep it boiling constantly. In intermittent processing the vegetable is processed for one hour on each of three successive days. The time is sometimes reduced to two days with very young string beans and some other more easily sterilized vegetables. It is not possible to give you the shortest time which may be used safely because of the varying conditions.

10. *Cooling*.—Cool all canned products as quickly as possible to stop the cooking, which breaks down the fruit and injures the flavor and color. Plunge cans into very cold water immediately, especially when processing intermittently. Never stack cans close together until entirely cold.

11. *Labeling*.—After 8 to 10 days, or immediately before selling, label all cans. Place the sealed end down so that the opposite end will appear at the top when placed on the shelf. Use a rather dry paste, and put it only on the label at the end so that no paste will touch the tin. If paste touches the can it may cause rust. Where a damp climate causes cans to rust easily, the outside of can may be lacquered before being labeled. Club members may use the "4-H Brand" label only on first-class goods. They must put net weight in pounds and ounces and packer's name and address on each can. Every girl thus guarantees her own goods.

Brining and seasoning.—Brine, sirup, or water are added immediately after packing to such fruits and vegetables as need to be surrounded by a liquid either for proper preparation or for purpose of sterilization. No more liquor is allowed than is actually necessary to cover the contents after as full a pack as possible is made. All 4-H Brand tomatoes have a mixture of sugar and salt added. Mix this in the proportion of one-third salt and two-thirds sugar and put two level teaspoonfuls in each No. 3 can of tomatoes and one teaspoonful in each No. 2 can. Use this for peas, lima beans, and corn. It is required that all products to be sold be packed with the sirup or brine indicated so as to come up to the standard. The flavor of such products is much superior to those without sugar or salt. In canning tomatoes, no addition of tomato juice in excess of the amount present in the tomatoes canned is allowed. Any water is considered an adulteration. In canning tomatoes in glass for exhibits and home use, when it is desirable to keep the tomatoes whole, they may be packed carefully and a thick liquor poured over them. This may be obtained by cooking smaller or broken tomatoes and putting through a sieve.

Brine for beans, okra, cauliflower, etc., should contain $2\frac{1}{2}$ ounces salt to a gallon of water. For asparagus, a heavier brine, 4 ounces to a gallon of water, is needed.

STANDARDS FOR 4-H BRAND CANNED VEGETABLES.

Tomatoes.—Cans to contain not less than 2 pounds 1 ounce tomatoes in No. 3 and not less than 1 pound 4 ounces tomatoes in No. 2. To be filled with sound ripe fruit, carefully peeled and cored; tomatoes to be whole or in large pieces, firm, uniformly red, and of good flavor.

Tomatoes and green pepper.—Cans to contain not less than 2 pounds packed in No. 3 cans. For this pack add one medium-sized green sweet pepper, after removing the stem and seeds, to each can of tomatoes.

String beans.—Net weight in No. 3 can before liquor is added at least 1 pound 8 ounces, brine 8 to 10 ounces. Net weight No. 2, 13 ounces beans and about 8 ounces liquor. Beans to be tender, green, uniform in size, well strung, and of good flavor. The net weight which appears on label should be for No. 3, 2 pounds, for No. 2, 1 pound 5 ounces.

Peas.—No. 2 cans to have at least 13½ ounces net weight of peas, and about 8½ ounces liquor—peas to be fairly uniform in size, tender, whole and of good flavor; liquor clear. Net weight appearing on label should be for No. 2 cans 1 pound 8 ounces.

Baby beets.—To be packed in No. 2 lacquered tins, about 30 baby beets to each can, maximum size 1½ inches in diameter and average size 1 inch in diameter. No. 2 can to have at least 16 ounces whole beets and 4 ounces liquid. Net weight which appears on label should be for No. 2 can 1 pound 4 ounces.

Okra.—Net weight of contents in No. 3 can should appear on label 2 pounds. Only young, tender okra should be packed, and it is best to simply remove cap without cutting into seed pod and pack it whole. Brine is added as explained in the table.

Peppers.—No. 2 cans to contain between 8 and 10 whole peppers. Flat No. 1 cans to contain 4 or 5 whole peppers, and net weight of contents appearing on the label should be for No. 2 can not less than 1 pound, or flat No. 1 can not less than 8 ounces.

Soup mixture.—Should consist of a mixture which is made in the proportion of one-half tomato pulp, one-fourth corn or tiny lima beans, and one-fourth okra with seasoning added. One slice onion 2 inches in diameter should be added to each No. 2 can. The tomatoes should be heated, rubbed through a sieve and cooked down to about the consistency of ketchup before measuring; then the corn, okra, onion and seasoning should be added and cooked until corn and okra are about three-fourths done. Then pack into cans and follow directions as given in table. Net weight of contents appearing on label of No. 2 can should be 1 pound 4½ ounces.

PREPARATION FOR CANNING IN GLASS.

Jars.—The glass top jar with wire clamp is the best type of jar for use in intermittent processing. If products are to be sold, a good commercial jar is necessary. Commercial jars when purchased in gross quantities are cheaper than household jars and can be chosen in appropriate size for each product. A 10 or 12 ounce jar with glass top and screw rim can be effectively used for preserves, jams, pickles, etc. Another good type of commercial jar is one with hermetic cap and can be had in different sizes for various products. A 4-ounce size is suitable for individual service, a 10-ounce size for general use.

Assemble all supplies and utensils such as jars, new rubbers and lids, wooden spoons, paddle, one-half pint measuring cup, measuring spoons, paring knives, sugar, salt, soda, etc., in a clean convenient place in which to work.

STEPS TO BE TAKEN IN CANNING IN GLASS.

The steps 1, 2, and 3, under "Canning in Tin" are also to be followed when packing in glass. Sterilize jars by placing them in a vessel, side down, covering with cold water, bringing to a boil and boiling for 15 minutes.

4. *Packing.*—After selecting fruit or vegetables for uniformity in size and quality (see score) it should be arranged with reference to symmetry and the best use of the space within the jar. In placing the fruit or vegetable in a jar, a thin, slender, flexible paddle made out of cane is useful. This paddle is also used to take out the bubbles of air by running it down the side of the jar to touch these bubbles after the liquor has been added to the pack.

5. *Adjusting the cap.*—Before placing the cap be sure that the rubber is flattened in its groove, without the presence of any seed or particle of the fruit. When a screw-top jar is used, screw the cap evenly about half way. When a glass-top jar with wire clamp is used, place lid

on evenly and raise both clamps up, the upper one fastened to hold the lid in place. With an hermetic jar, fasten the cap on the jar evenly with the clamp. The last jar is self-sealing as it cools.

6. *Processing*.—Place the jars in a water bath on a rack (wooden one good) to avoid breaking. Have water the same temperature as the contents, letting it come to within 2 inches of the tops of jars. Have a tight cover for the vessel to keep in the steam. Do not count time until the water begins to boil; keep it boiling steadily for the time required. Seal the jars air-tight promptly at end of processing and remove them from the bath, being careful not to allow a cold draft to strike them. In intermittent processing, raise the clamp of each jar at the beginning of each processing to allow for expansion. Seal at close of each processing. The hermetic jar is not a suitable one for intermittent processing.

7. Store products in a cool, dry, dark place.

8. *Labeling*.—Before labeling, wash and polish each jar. Place the label on the plain side of the jar midway between the seams one-fourth inch from the lower edge. On every label must appear the name of the contents, name and address of the packer, and net weight in pounds and ounces.

Score for judging the quality of canned fruits and vegetables.

	Score of 100.	Score of 30.
I. Appearance.....	25	7½
(a) Color.		
(b) Clearness.		
II. Texture.....	10	3
III. Flavor.....	20	6
IV. Uniformity.....	15	4½
(a) Ripeness.		
(b) Appropriate size.		
V. Pack (arrangement).....	15	4½
VI. Container.....	15	4½
(a) Appropriate package.		
(b) Label.		
(c) Neatness.		

STANDARDS FOR 4-H BRAND CANNED FRUITS.

Figs.—Net weight contents No. 2 enamel-lined can of figs should appear on label not less than 1 pound 6 ounces. Figs should remain whole and a No. 2 can contain about 30 to 35 whole figs.

Peaches.—No. 3 can to have at least 1 pound 5 ounces solids and 11 ounces liquid; to contain between 10 and 12 halves of peaches and have net weight of contents appearing on label not less than 2 pounds.

Pears.—Net weight in No. 3 can should be not less than 2 pounds, having 11 ounces liquid, 1 pound 5 ounces solids, and between 12 and 14 halves.

Berries.—No. 3 can blackberries or raspberries, net weight 2 pounds; No. 2 cans, net weight 1 pound 6 ounces, whole berries weighing about one-half of total in each case. Berries to be large, whole, of good color and flavor. The sirup used in packing must be made out of strained berry juice and sugar, no water added. Always pack in enamel-lined cans.

MARY E. CRESWELL,

OLA POWELL,

Assistants in Home Demonstration Work.

Approved:

BRADFORD KNAPP,

Chief, Office of Extension Work, South.

CANNING VEGETABLES (HOT-WATER PROCESS).

Do not attempt to use this table without reading all directions carefully.

Vegetable.	Blanch, minutes.	Liquor.	In tin.			In glass.	
			No. of can.	Exhaust, minutes.	Process.	Jar.	Process.
Asparagus.....	3 to 4.....	Brine (heavy)....	2	3	Intermittent or 2 hours	Pint....	Intermittent or 2 hours continuous.
String beans.....	3 to 8.....	Brine.....	2	3	Intermittent.....	do....	Do.
Do.....	.....	do.....	3	5	do.....	Quart....	Intermittent.
Lima beans.....	2 to 5.....	Salt, sugar, water..	2	3	do.....	do....	Do.
Beets.....	Cook $\frac{3}{4}$ done, peel..	Brine.....	2	3	1 to 2 hours.....	do....	1 $\frac{1}{2}$ to 2 hours.
Carrots.....	Cook $\frac{3}{4}$ done, scrape.	do.....	2	3	1 hour.....	do....	1 hour.
Corn.....	1 to 3 (blanch on cob).	Salt, sugar, water..	2	10	Intermittent.....	do....	Intermittent.
Okra.....	10 to 15.....	Brine.....	2	3	do.....	Pint and quart.	Do.
Peas (very young) ..	1 to 3.....	Salt, sugar, water..	2	3	45 minutes first day, 35 minutes second and third days.	Pint....	Same as No. 2.
Peas, medium.....	3 to 8.....	do.....	2	3	Intermittent.....	do....	Intermittent.
Potato, sweet.....	Cook $\frac{3}{4}$ done, peel..	Pack dry.....	3	15	3 hours.....	Quart....	3 hours.
Rhubarb.....	.....	Cold water.....	2	2	15 minutes.....	do....	15 minutes.
Soup mixture.....	.....	Salt, sugar.....	2	5	2 hours or intermittent	do....	2 hours or intermittent.
Tomato.....	.....	do.....	2	2	20 minutes.....	Pint....	15 minutes.
Do.....	.....	do.....	3	3	30 minutes.....	Quart....	30 minutes.

NOTE.—String beans packed in No. 2 cans are preferable because more surely sterilized.

Corn, Lima beans, and peas should never be packed in larger container than No. 2 and processed always Intermittently. Corn is cut from cob after blanching.

Soup mixture containing corn and Lima beans should always be processed Intermittently.

The brine used is made of $2\frac{1}{2}$ ounces salt to 1 gallon water, except for asparagus, which contains 4 ounces to 1 gallon.

Beets and rhubarb when packed in tin must be put in enamel-lined cans.

CANNING FRUITS (HOT-WATER PROCESS).

Fruit.	Blanch.	Sirup.	In tin.			In glass.	
			No. of can.	Exhaust, minutes.	Process, minutes.	Jar.	Process, minutes.
Apples.....	1 minute.....	No. 1.....	3	2	8	Quart....	12
Berries.....	.....	No. 3.....	2	2	10	do....	10
Cherries, sweet.....	15 seconds.....	do.....	2	2	20	do....	25
Cherries, sour.....	do.....	No. 4.....	2	2	20	do....	25
Currants.....	.....	No. 3.....	2	2	15	do....	15
Figs.....	Soda blanch.....	do.....	2	2	25	do....	30
Gooseberries.....	.....	do.....	2	2	15	do....	20
Guava.....	15 seconds.....	No. 4.....	2	3	20	do....	35
Do.....	do.....	.....	3	3	25	Pint....	25
May haw.....	.....	No. 3.....	2	2	20	Quart....	25
Peaches.....	15 seconds.....	No. 4.....	3	3	15	do....	20
Pears.....	do.....	No. 3.....	3	3	20	do....	25
Plums.....	Prick with needle.....	No. 4.....	2	2	12	do....	15

NOTE.—Berries, cherries, currants, figs, gooseberries, May baws, and plums when packed in tin must be put in enamel-lined cans.

To make the sirups recommended, boil sugar and water together in the proportion given below until sugar is dissolved. Strain all impurities out of the sirup before using:

Sirup No. 1, use 14 ounces to 1 gallon water.

Sirup No. 2, use 1 pound 14 ounces to 1 gallon water.

Sirup No. 3, use 3 pounds 9 ounces to 1 gallon water.

Sirup No. 4, use 5 pounds 8 ounces to 1 gallon water.

Sirup No. 5, use 6 pounds 13 ounces to 1 gallon water.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

4-H BRAND SEED CORN LABELS.

All Corn Club members whose names are enrolled with the State Colleges of Agriculture and the U. S. Department of Agriculture, cooperating, and who are growing their Corn Club plat under the requirements of the National Corn Club work are entitled to the use of the 4-H Brand seed corn label.

In case you wish to use some of these labels and can meet the requirements given below, we would suggest that ~~you see~~ your State and local leader in charge of Club Work with reference thereto. If he ~~does~~ not have these labels we shall be glad to forward a supply to him.

The requirements for the use of this seed corn label are as follows:

1. Club members must have a definite standard variety or strain of corn.
2. Seed corn must be selected by hand before the ordinary corn of the acre is gathered.
3. Club members must state on the label the yield per acre from which the seed was selected.
4. All corn sold under this label must have been subjected to the germination test, the percentage of results being set forth on the label.
5. The 4-H Brand label must be signed by club member and O. K.'d by State, district, or county leader, or local chairman of committee authorized to check up and indorse club members' seed.



In Charge of Club Work, North and West.

Approved:

C. B. SMITH,

Chief, Office of Extension Work, North and West.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE
OF EXTENSION WORK, NORTH AND
WEST, WASHINGTON, D. C.

FARM AND HOME HANDICRAFT CLUBS.

The purpose of this club project is to encourage boys and girls to spend their spare moments during the fall and winter months, or during the entire school year, in doing constructive work and making useful things for the farm and the home. Such handicraft work may be readily correlated with the manual-training work of the school and with the agriculture and home economics club work for the summer vacation. It may be so planned as to extend over twelve months, or may be limited to the regular nine months' school year.

This outline is furnished as a suggestive guide to the State, district, and county leaders with a view to helping them to cooperate intelligently in the club work and to encourage and promote it as far as possible. Detailed plans and follow-up instructions for the club work should be prepared and furnished to the school and club members by the State agents in charge of the boys' and girls' club work, and should have special bearing upon the particular needs of their States.

DETAILS OF ORGANIZATION.

It is suggested:

1. That the age limit for members be the same as in other clubs, i. e., from 10 to 18 years, inclusive.
2. That each club member be required to select not fewer than 10 of the industrial units listed below, and to work upon each of them during the school or calendar year. If thought desirable by the leader, a club member may specialize in one line of work, with a view to acquiring so much skill that his product will be salable. In such cases he should be required to produce 20 samples of his special kind of work.
3. That all of the work undertaken be exhibited at some place selected by the State or district club leader. The exhibits may be in miniature or by photograph or drawing where the exhibit space will not permit the showing of original pieces.
4. That club members be required to furnish drawings, plans, and specifications of all the units selected by them whenever this seems necessary.
5. That all members taking up this work be required to keep records of observations, costs, and receipts, and to furnish reports of the work in the form of financial statements and written stories on the subject "How I Did My Handicraft Club Work."
6. That leaders consider seriously the desirability of marking the industrial units A and B—A for the girls' clubs and B for the boys' clubs. This may be desirable in some places and not in others. Leaders should not incorporate in the club program any of the kinds of work definitely required in other outlined projects and should add to the list any others that are especially adapted to their communities.

BASIS OF AWARD.

	Per cent.
1. Number and character of enterprises undertaken and completed.....	25
2. Condition of the finished products exhibited.....	25
3. Skill, speed, and accuracy shown by a demonstration in four units.....	25
4. Written report and records of work.....	25
Total score.....	100

HANDICRAFT UNITS OUT OF WHICH 10 ARE TO BE SELECTED.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Rope tying and splicing (10 knots tied and mounted) 2. Making seed testers (box, blotter, and rag-doll testers). 3. Making a hencoop and brooder. 4. Fruit grafting and tree surgery. 5. Making a flytrap or window screen. 6. Making a wood box for kitchen or sitting room. 7. Making a bird house and watering trough. 8. Making a hotbed or cold frame. 9. Making a stepladder or handy ladder for farm and home. 10. Making 1 dozen vegetable market crates. 11. Sharpening saw, pair of scissors, carving knife. 12. Making a medicine cabinet. 13. Making and laying a cement walk or floor. 14. Making a bookcase or library file. 15. First aid to farm implements, i. e., repairing. <ol style="list-style-type: none"> (a) Whippetree. (b) Pair of shafts. (c) Fork handle. (d) Gate. 16. Drawing plan of 80-acre farmstead. 17. Forging—two kinds, practical, related to farm work. 18. Welding—two kinds, practical, related to farm work. 19. Horseshoe making. 20. First aid to household furniture, i. e., repairing. <ol style="list-style-type: none"> (a) Chair. (b) Table. (c) Picture frame. (d) Door lock or hinge. | <ol style="list-style-type: none"> 21. Pressing and cleaning men's and women's suits. 22. Papering a room. 23. Painting, staining, or treating floor. 24. Making a farm dooryard gate. 25. Making a homemade fireless cooker, one of two methods. 26. Making a home canner, one of two methods. 27. Making a kitchen shelf or kitchen work chair. 28. Getting out a set of plans and specifications for model farm home. 29. Giving first aid to school furniture and equipment, such as the repair of a seat, window, fence, broken gate, blackboard, doorstep, or sidewalk. 30. Repairing the cover or broken back of a book. 31. Metal work for household. 32. Modeling in clay and plaster. 33. Leather work; repair of leather goods or art work. 34. Dyeing, stenciling, and block printing cloth. 35. Pottery for use in the home. 36. Basketry, i. e., making baskets for use in gathering and marketing vegetables and fruit. 37. Making a milk stool or bread-cutting board. 38. Homemade mill for fruit juice and cider. 39. Hat and coat rack for hall. 40. Making a table or a workbench. 41. Knitting or crocheting a rug. 42. Drafting a pattern for a garment or cutting and fitting a garment. 43. Mending pottery, china, and glass. |
|---|---|

HOW TO PREPARE CIRCULARS AND LITERATURE.

One of the most important duties of the leaders of the boys' and girls' club projects or other extension work is the preparation and distribution of well-prepared sets of follow-up instructions. It is a mistake to incorporate all of the instructions in one circular and to send them out all at one time.

The system of follow-up instruction should include the following:

1. A circular explaining in brief what the club project is, stating briefly its objects, its relations to the farm and home activities, and how it is to be correlated with the work of the schools. This might also have a statement of the requirements, basis of award, etc., as suggested in this circular.
2. Enrollment blanks and enrollment cards to be used by the local leaders, teachers, and county superintendents to be sent out with the circular of explanation.
3. Personal letters, directed to leaders, giving them definite instruction as to how to proceed to organize and how far to explain to the boys and girls the requirements of the work.

4. A circular of from 10 to 12 pages, giving information about securing materials, choice and care of tools, preparing a little workshop, cost of equipment, always recommending that members make their own equipment as far as possible, especially workbenches, nail boxes, handles, etc.

5. A circular in which the drawing plans and specifications of the 12 most practical and important units are given, with suggestions for their use.

6. A second circular similar to the first giving drawing plans and specifications for all the rest of the units offered. A few paragraphs giving something of human interest might well be used in connection with the drawings and specifications.

7. A little circular of instruction to be used for the midwinter club festival of the handicraft club members, containing suggestions and recommendations for preparing and making exhibits, for holding demonstrations in the club units, and for play contests based entirely upon the farm and home handicraft work. In this circular or in an additional one suggestions and recommendations for the sale of the products can be given.

8. A little circular connecting the work up with the school by giving suggestions as to how it may be correlated with the regular subjects of the schoolroom.

9. A circular giving definite directions and program outlines for the bimonthly meetings covering the entire year.

It is of greater value to the State work to prepare thoroughly and well one club project and its set of follow-up instructions than to do many of the projects in a superficial way.

Club leaders in charge of the State-wide work are urged to seek the cooperation and help of the professor of manual training in the State college of agriculture as well as of the heads of departments and specialists in charge of the poultry, home economics, or farm crops divisions of the institution. By getting expert advice they will be able to work out the best possible sets of instructions. As an extension man representing two institutions to the boys and girls of the State, the leader should embody the best information available in all of his extension circulars.

The best time to enroll the club members in this particular project is at the opening of the school year, in the early fall, and we urge that the members of all other clubs (corn, potato, pork, poultry, baby beef, home canning, etc.) be invited to take up this club work for the winter months.

The organization of the Farm and Home Handicraft Club, and many of the ideas included in this little outline, were recommended by Otis E. Hall, State agent in charge of boys' and girls' club work for Kansas. Mr. Hall, assisted by Mr. G. E. Bray, in charge of the manual-training shops of the State Agricultural College, at Manhattan, Kans., has prepared a set of instructions on this particular type of work. It is suggested that one of the circulars of instruction on the Kansas farm and home handicraft club work be secured. E. C. Bishop, of the Iowa State College, has issued a number of handicraft circulars which it would also be profitable to secure.

O. H. BENSON,
In Charge Club Work.

Approved:

C. B. SMITH,

Chief, Office of Extension Work, North and West.

Issued December 2, 1915.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH
(Farmers' Cooperative Demonstration Work),
WASHINGTON, D. C.

ORGANIZATION OF BOYS' AGRICULTURAL CLUB WORK IN THE SOUTHERN STATES.¹

OBJECTS.

Boys' agricultural club work, organized through the efforts of the Office of Extension Work in the South (Farmers' Cooperative Demonstration Work) of the States Relations Service, United States Department of Agriculture, working in cooperation with other forces of the South, has, among other objects, the following:

1. To encourage and train boys along the lines of the activities of country life.
2. To put into practice the facts of scientific agriculture obtained from books, bulletins, etc.
3. To bring the school life of the boy into closer relationship to his home life.
4. To assist in the development of the spirit of cooperation in the family and in the community.
5. To dignify and magnify the vocation of the farmer by demonstrating the splendid returns which may be secured from farming when it is properly conducted.
6. To enlarge the vision of the boy and to give him definite purposes at an important period in his life.
7. To furnish to the aggressive, progressive rural school teacher an opportunity to vitalize the work of the school by correlating the teaching of agriculture with actual practice.

CORN CLUBS.

Corn was selected for the first demonstrations, because it is a plant that can be profitably produced in most sections of the United States. The boys throughout the country have common knowledge of it from childhood, and the lessons seem easy (see fig. 1). Corn yields more food to the acre in most sections of the United States, when properly handled, than any other grain crop. Food for men and animals is one of the first necessities. Cheapness of production is an important item. The growing of more and better corn in the South is necessary for better farm conditions. It forms part of a proper rotation for soil building and will furnish feed for a more extended live-stock industry. It is the foundation crop for home use in most of the Southern States. Its more extensive growth will encourage diversification.

KAFIR, MILO MAIZE, AND FETERITA CLUBS.

In addition to corn clubs, it has been found to be wise to organize other clubs. In western Oklahoma and Texas, where corn is not adapted to the climate, it has been found advisable to organize boys in kafir, milo maize, and feterita clubs. One acre is the unit for these clubs.

COTTON CLUBS.

Cotton is a standard crop in the South and in any system of diversified farming must occupy an important place. Therefore a few cotton clubs have been organized for the purpose of teaching boys how to make the greatest yields at the lowest cost. Hereafter the unit of acreage for cotton will be 1 acre.

¹ The administration of agricultural club work should be adapted by the offices in charge to local conditions.

PEANUT CLUBS.

In 1914 peanut clubs were organized in Virginia. These clubs proved to be quite successful. In the future these clubs will be organized throughout the territory adapted to the growing of peanuts. The unit of acreage in peanut clubs is 1 acre.

POTATO CLUBS.

Potato clubs should be organized wherever there is a demand for them. The unit of acreage in potato clubs is one-eighth of an acre.

PIG, POULTRY, AND BABY BEEF CLUBS.

In cooperation with the Bureau of Animal Industry there have been organized pig, poultry, and baby beef clubs. In a number of States the Bureau of Animal Industry has placed a



FIG. 1.—A Kentucky corn club boy in his well-cultivated acre of corn.

specialist to cooperate with the agents of the Office of Extension Work in the South (Farmers' Cooperative Demonstration Work) in the pig and poultry club work.

Other agricultural clubs may be organized to serve the needs of communities in which they are located. It is thought best, however, not to multiply clubs.

HOW BOYS' AGRICULTURAL CLUBS ARE ORGANIZED.

Arrangements have been made for active cooperation with the extension divisions of the agricultural colleges, and, where local conditions will permit, with State and county superintendents of education and others.

After enrollment of the club members a meeting or meetings of the boys interested should be held, either at the courthouse or at some central place in the country, for the purpose of

instruction and organization. Efforts will be made by the county farm demonstration agent to get in touch with every boy through a system of group meetings for the purpose of instruction. The cooperation of the school authorities is necessary for this purpose. Such meetings should be held in ample time to give instructions regarding the preparation of soil (see fig. 2), selection of seed, fertilizers to be used, methods of planting, cultivating, harvesting, etc. It is estimated that a series of these meetings for each county, held at three different times in the year, will be sufficient to give ample instructions to the boys.

The best results are generally obtained when the following plans are followed in a county:

1. The local teacher organizes the club and sends the names and addresses of the boys to the county agent of the farmers' cooperative demonstration work. In case there is no county agent in the county, the teacher sends the enrollment to the county superintendent of education.

2. The county agent, in cooperation with the county superintendent of education, directs the work in the county, holds county meetings, formulates the county rules, and settles all



FIG. 2.—Deep plowing and the thorough preparation of the seed bed aided Sherman Hall, a corn club boy, in making 107.33 bushels of corn on his acre.

county contests. He receives the names and addresses of the boys from the local teachers, makes copy of the same for his office, and sends copy of names and addresses, arranged alphabetically, to the county superintendent of education and to the State agent in charge of boys' agricultural clubs. When there is no demonstration agent in the county the county superintendent sends names and addresses to the State agent in charge of boys' agricultural clubs.

Blanks for enrollment will be furnished to the local agents and to superintendents, teachers, and other county leaders in this work.

CLASSIFICATION OF CLUBS.

It is important to classify the club membership with reference to the number of activities engaged in, as, for example, class A, boys engaging in one activity; class B, those engaging in two lines of work; class C, those following three lines; class D, those following four lines, and so on.

HOW THE CLUBS ARE INSTRUCTED.

1. The county demonstration agent is the instructor of the county club on the plats of the members. He should give instructions on the preparation and fertilization of the soil, selection of the seed (see fig. 3) to be used, cultivation of crops, and assist in obtaining correct results at the time of harvesting. He should assist the boys in every way possible. He should be assisted by the county superintendent of education in the enrollment of members.

2. The school officials should have a sympathetic attitude toward the work at all times. They should assist the boy in selecting and measuring his land, help him to understand the bulletins, circular letters, etc., on the growing of his crop, visit his plat from time to time, encourage him to do his best, and see that correct measurements are made at the time of harvesting.



FIG. 3.—Corn club boys selecting seed corn in the field for next year's planting.

3. Parents should assist their boys in all legitimate ways and encourage them to follow instructions closely. Under no circumstances should parents attempt to hinder the boy in carrying out the instructions given by the county agent.

ROTATION OF CROPS.

Crop rotation is of the greatest importance in maintaining soil fertility. It is essential, therefore, in teaching a better system of agriculture in the club work, that boys be led away from the "one-crop" system. Too frequently boys plant the same acre to corn or other crop year after year, thus putting into practice the very system which has impoverished the lands of the South. Therefore we earnestly insist that crop rotation, with leguminous plants in the rotation, be practiced by all boys belonging to corn clubs. The same crop should not be planted on the same acre two years in succession. The following two-year rotations, or a modification

of the same, will be found suited to conditions in the territory of the Office of Extension Work in the South:

First year.—Corn, with cowpeas or soy beans, followed by winter cover crop of oats or rye, with clover or vetch, to be turned under.

Second year.—Cowpeas or soy beans or peanuts, to be followed by winter crops (see fig. 4), to be turned under, returning to corn the third year. If a boy must use the same acre for corn the second year, he should certainly put a winter cover crop on it.

PRIZES AND PREMIUMS.

It is suggested that prizes be offered for the best results the second year with peanuts, cowpeas, soy beans, or velvet beans, as a money crop on an acre which has been in corn the year before. Of course the winter cover crops will be plowed under.

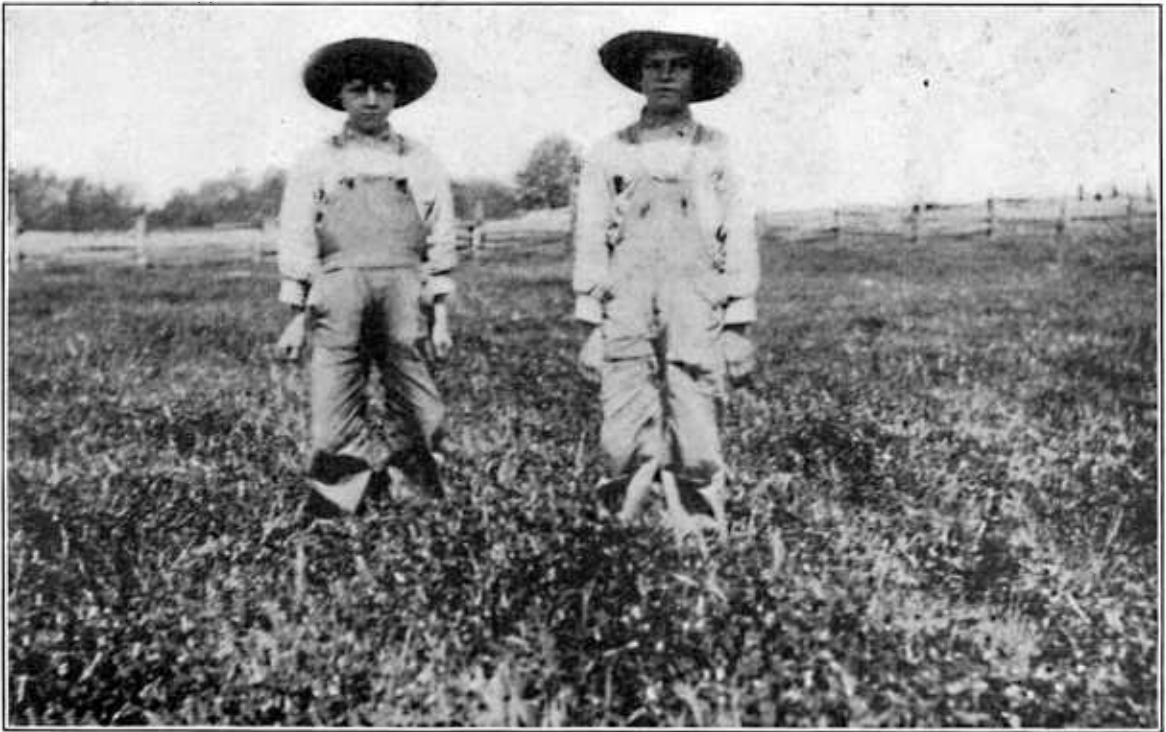


FIG. 4.—Corn club boys who planted a winter cover crop of crimson clover to turn under on their demonstration acres.

If the merchants and other public-spirited citizens have been visited and the work explained to them before the organization of the clubs, it will be found comparatively easy to raise a fund to cover the expense of giving prizes to the successful contestants. Thousands of dollars have been contributed in this way during the past few years. It must be understood that the United States Department of Agriculture does not furnish any money for prizes and is not offering prizes. In the extension work in the South it is found that considerable interest can be added by securing offers of prizes from public-spirited citizens of the community or State. The chief prize in each State should be a year's expenses in an agricultural high school or college. The following additional prizes are suggested and have been offered in various States and localities:

Trips to expositions, State and county fairs; scholarships in short courses in agricultural colleges and schools (see fig. 5); different kinds of farm vehicles and implements; registered pigs; pure-bred chickens; fine colts; registered calves; bicycles; shotguns; watches; articles of clothing; books on agriculture and horticulture; cash prizes, from \$2 up to \$20, etc.

It is better to offer many small prizes than a few large ones, as it furthers the interest if recognition and honor can be given for the excellent records of as many boys as possible. Some boards of trade and chambers of commerce have made direct appropriations for prizes and some have shown their recognition of the efforts of the clubs by giving the boys banquets and entertaining them at their meetings at the county seats with street car rides, and at fairs and on other occasions clubs have been honored by being invited to march or appear in parades, attracting great attention. In some States the boys have been entertained in private homes



FIG. 5.—Members of boys' corn clubs attending short course.

during the time of the State fair or corn show, thus stimulating friendly and intimate relations between the rural and urban population. It is a good plan to offer prizes to community clubs which will make the best records with teams of 10 to 20 boys. In this way the results are better and the prizes more generally distributed.

CIRCULARS AND BULLETINS.

Circulars of instruction on the preparation of the seed beds, the value and uses of home and commercial fertilizers, planting, cultivation, seed selection, etc., will be mailed to all the boys enrolled. From time to time circular letters calling special attention to various steps in raising their crops will be mailed to each of the boys. The circulars mentioned furnish excellent subject matter for discussion at club meetings or in schools. The United States Department of Agriculture and the colleges publish annually a large number of bulletins which contain most valuable information on many subjects of interest to farmers. From time to time the

attention of the members of the club will be called to timely Farmers' Bulletins, which may be had free of charge upon request. Many of the boys study these bulletins and circulars and profit by the lessons and discussions because they are making practical application of the principles taught. The boy learns scientific agriculture because he needs it and not because it is scientific. A boy who has joined the boys' agricultural clubs and fails to receive the circulars of instruction on these various subjects should notify the State agent in charge of agricultural club work in his State, so that the error may be corrected.

The boys will also be furnished with crop-record blanks, detailing a method of keeping an account of the expense of production and specifying the steps to be taken in growing their crops.

RULES OF AWARD.

It is not necessary to have many rules; the fewer the better. A few simple regulations, however, are necessary, in order to prevent misunderstandings and conflicts. It is well for the boys to elect their own president, vice president, secretary, and treasurer, either in clubs or in county organizations. It is often helpful if these officers, with one or two additional interested parties, constitute an executive committee.

The following rules should be adopted by the clubs, with such modifications to suit local conditions as may be found necessary:

1. Boys entering clubs and entering contests must be between 10 and 18 years of age on January 1 of any given year.
2. No boy should be allowed to contest for a prize unless he becomes a member of the club and agrees to submit his reports.
3. Members of the clubs must agree to study the instructions of the Farmers' Cooperative Demonstration Work.
4. Each boy must plan his own crop and do his own work; if a small boy, from 10 to 14 years, he may hire help for heavy plowing in the preparation of the soil. The hearty cooperation of the father of the boy is of great value.
5. Exhibits of 10 ears of corn, accompanied by a written report and a written account, showing the history of the crop, must be made at a place designated for the purpose in the county. Such exhibits may be held on a given day, either at the county fair, or, if no fair is held in the county, at the courthouse or some other convenient place.
6. The land upon which the boy's crop is made must be carefully measured and the corn weighed in the presence of two disinterested witnesses, who shall attest the boy's certificate. This certificate must show that the plat contains 4,840 square yards. The crop must grow upon the acre.
7. The entire crop of corn from the acre in the husk should be weighed when it is in a dry condition. Then weigh out 100 pounds separately. Husk and shell this 100 pounds and weigh the shelled corn. Multiply the weight of all the corn in the husk by the weight of this shelled corn. Point off the two right-hand figures and divide by 56. The result will be the yield in bushels of shelled corn. In every case where there is a prospective yield of 100 bushels or more, notice should be sent to the State agent in charge of boys' clubs in the State. A moisture-tight container will be sent for a sample of the corn, which will be taken before witnesses, as directed in the circular which will be forwarded to the contestant. This container should be sent by mail, under a frank which will accompany it, to the Office of Grain Standardization, Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C., where a moisture test will be made. This test is made in order to reduce all high yields to an even standard. The Office of Grain Standardization allows 14 per cent of moisture in No. 1 corn. Under this plan the same laboratory will make the tests for all the boys, and fair treatment is thus guaranteed.
8. The club acre must be all in one body.
9. In awarding prizes the following basis should be used in corn, cotton, and peanut clubs:

	Per cent.
(a) Greatest yield per acre.....	30
(b) Best exhibit.....	20
(c) Best written account, showing history of the crop and how to select seed.....	20
(d) Best showing of profit on investment based on the commercial price of crop.....	30

The following basis of award may be used for a limited territory where the contests are on poor land:

	Per cent.
(a) For percentage of increase.....	30
(b) For profit.....	30
(c) For exhibit.....	20
(d) For history.....	20

In such cases a disinterested committee, or a demonstration agent, determines what would be the normal yield of the acre when turned over to the boy. In order that boys who have good land may not be debarred from State-wide competition an additional 30 points for yield may be added to the above. Within the limited territory the 30 points for percentage of increase would obtain, while in the State the 30 points for yield would be used.

Basis of award in potato clubs:

	Per cent.
(a) Greatest yield.....	40
(b) Best showing of profit on investment.....	30
(c) Best exhibit.....	15
(d) Best history on how I made my crop of potatoes.....	15

An exhibit of corn consists of 10 ears; of kafir, milo maize, or feterita, 5 heads; of cotton, 2 pounds of seed cotton and 10 open bolls; of peanuts, 1 peck of cleaned nuts and 10 vines; of potatoes, 1 peck of seed potatoes.

In estimating the profits, uniform prices should be used. For instance, \$5 per acre, or \$1 for one-eighth of an acre, for land rental; 10 cents per hour for the work of each boy, and 5 cents per hour for each horse; \$2 for a two-horse load of stable manure, weighing about a

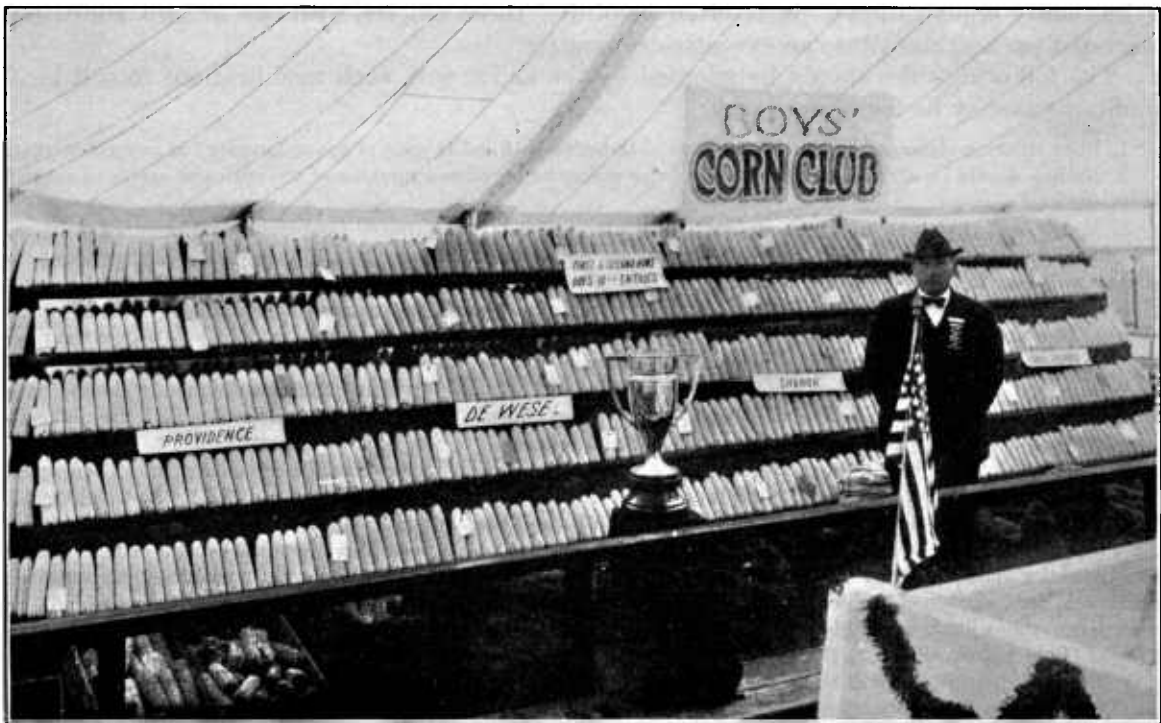


FIG. 6.—Boys' corn club exhibit.

ton; \$1 for a one-horse load of manure, weighing about half a ton; and the market price for commercial fertilizer. This plan of cost accounting has the advantage of great simplicity, but other methods of accounting may be adopted by special arrangement.

BADGES AND EMBLEMS.

An emblem or badge has been designed for the boys' agricultural clubs, consisting of a book for the background, with a four-leaf clover and a kernel of corn, or boll of cotton, or potato, on the book. The word "demonstrator" appears at the top of the book and the words "Boys' corn, cotton, or potato clubs" at the bottom. Four "H's" appear, one upon each of the leaves

of the four-leaf clover. The book is intended to emphasize the necessity of education and definite knowledge of farm and home interests for better country life. The kernel of corn, or boll of cotton, or potato, denotes the crop being raised, and the clover leaf combined with it is an emblem of the necessity of scientific training, rotation of crops, soil building, and consequent larger education. The four "H's" signify the training of the head, hands, heart, and health, which are essential to the well-rounded life. The word "demonstrator" has the same meaning as in the work with the farmer and signifies that every club member is a demonstrator of the better methods of modern agriculture. These badges or pins are not given out by the Department of Agriculture. They are often furnished free to members by those interested in the clubs,



FIG. 7.—Sherman Hall, a member of a boys' corn club in Arkansas, secured by proper preparation and cultivation a yield of 107.33 bushels of corn on his demonstration acre.

especially as a reward for excellent work during the season in raising their crops. The cost is very small. In some counties the use of these pins has proved of assistance when given as a prize to every member who raises a crop and makes a final report and exhibit.

ALL-STAR CORN CLUB.

The All-Star Corn Club of the United States in the future will be made up of boys who make 100 or more bushels of corn on their acres. They and the prize winners, who have come to Washington in the past, alone, are entitled to wear the "all-star" emblem. The all-star boys should receive certificates from the extension divisions of the agricultural colleges.

The requirements for membership in the All-Star Corn Club are uniform throughout the United States by arrangement between the offices concerned. As indicated above, a special badge has been designed for boys in this club. Special contests should be arranged for members of the All-Star Corn Clubs on a larger acreage.

FAIRS AND EXHIBITS.

Where there is a county fair the boys' exhibits (see fig. 6, p. 8) should be made there, if possible. Where there is no county fair the exhibits should be collected at the courthouse or some other public place. Exhibits of this sort often lead to the establishment of a county fair, and they stimulate the work and give splendid opportunities for general instruction. Although the club exhibit starts with corn, its development naturally leads to the exhibition of other farm and garden products.

RESULTS.

The object of the boys' demonstration work is the same as that among men—viz, to secure the adoption of better methods of farming and greater yields (see fig. 7, p. 9) at less cost. Many of the boys in the clubs who begin to study agriculture in this way will continue the study in the agricultural colleges; others will continue such efforts on their farms, and all of them will make more useful and more efficient citizens. From the pleasant and profitable experience of owning and managing their small plats they will develop into independent, intelligent farmers. The country needs these farmers, and such a life offers great opportunities. The professions are crowded and the wage earners must pay high prices for the necessities of life. The wise and judicious producer can enjoy health, wealth, and contentment. Success in this work is good training for usefulness in any line. The question is, how many boys can be reached and influenced thus to succeed?

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Approved:

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH
(Farmers' Cooperative Demonstration Work)
WASHINGTON, D. C.

CANNING CLUB AND HOME DEMONSTRATION WORK.

CANNING CLUBS.

The girls' demonstration work in the South began with the canning clubs in 1910, when four counties in two States were organized. Nearly 50,000 girls were enrolled in 1915 under the supervision of about 400 women agents in the 15 Southern States. The enrollment for 1914 was 33,173. In 1914 7,793 members put up 6,091,237 pounds of tomatoes and other vegetables from their tenth-acre gardens. These products were put into 1,918,024 cans, jars, and other containers, and they are estimated to be worth \$284,880.81, of which nearly \$200,000 is profit. The average estimated profit per member was \$23.30. Furthermore, these girls put up thousands of dollars worth of other products from the farms and orchards. Club members are learning how to make out reports and these statistics will be fuller as the work develops. The following county records are of special interest:

County records of canning club work.

State.	County.	Number of club members reporting.	Number of cans and jars.	Estimated value.
North Carolina.....	Alamance.....	90	55,165	\$7,039.65
Alabama.....	Etowah.....	136	46,533	5,970.17
North Carolina.....	Anson.....	60	38,540	5,016.20
South Carolina.....	Barnwell ¹	33	9,220	3,327.68
Georgia.....	Hart.....	44	14,846	2,290.16
Tennessee.....	Knox ²	73	12,409	2,003.90
Kentucky.....	Daviess.....	29	10,343	1,141.25
Virginia.....	Alleghany.....	16	9,769	1,586.10

¹ The girls in Barnwell County, S. C., sold large quantities of fresh and canned pimentoes.

² In addition to the above figures, the club members of Knox County, Tenn., put up 2,930 cans and jars of other products of the farm and orchard.

The following excellent county records give totals in pounds of fresh tomatoes because so many tomatoes were sold fresh:

Specimen records in pounds of tomatoes.

State.	County.	Number of club members reporting.	Number of pounds fresh tomatoes.	Number of cans and jars.	Estimated value.
Tennessee.....	Hamilton.....	102	121,822	27,231	\$4,240.00
West Virginia.....	Kanawha.....	58	119,586	17,634	2,251.47
Arkansas.....	Pulaski.....	172	91,049	8,944	2,766.92
Mississippi.....	Harrison.....	80	33,562	4,867	1,787.95
South Carolina.....	Chester.....	58	105,204	9,754	1,539.00
Florida.....	Warren.....	43	12,194	4,732	811.79

The work of making choice preserves, jelly, marmalades, and pickles has been done by the more advanced girls, thus developing the special products best adapted to the different sections of the Southern States. Special work has been done with peaches, berries, grapes, figs, scuppernongs, mayhaws, ajeritas, oranges, kumquats, and many other fruits of the South. Nearly 3,000 girls now belong to poultry clubs and several hundred have been doing excellent work in bread demonstrations. Many of the better trained club members are succeeding with winter gardens. They are growing such vegetables as spinach, cauliflower, lettuce, endive, asparagus, and celery, some of which are new to the girls.

On November 16, 1914, an 11-year-old Virginia club member began a winter garden 20 feet wide and 50 feet long, which was a part of her tenth-acre garden which had been cultivated the previous summer. Spinach, lettuce, radishes, rape, kale, and mustard were planted in November and December, and in March and April, potatoes and peas. She gathered in all 357 pounds of vegetables and sold from her cold frame 700 collard plants, 800 cabbage plants, and 400 tomato plants. This crop was worth \$17.05 and gave a profit of \$14.25. She writes: "My mother has learned how to make a great many new dishes out of the vegetables in my winter garden."

As the girls' canning club work grows it becomes necessary to have more and more system in its development. A certain amount of gradation will make for efficiency in the conduct of these clubs. A natural and logical expansion of this work not only leads to additional crops and supplementary duties for the girls to carry out, but it also calls for some practical and useful demonstrations to be conducted by the mothers of the girls and by the women generally.

Thus far through 15 Southern States the girls' club work has begun with the one-tenth acre gardens in tomatoes. Tomatoes should still be the first crop. The study and use of the tomato should still be the course for the primary classes. Every girl who goes into the work should master this plant and learn how to utilize its products before being allowed to take up other vegetables and fruits. However, in sections where tomatoes suffer from blight and wilt it may be necessary to start with other crops and perhaps temporarily stop growing tomatoes in the club gardens.

The second-year girls engaged in canning club work should continue to grow tomatoes on one-half of their garden space and then take up one other crop on the other half. This additional crop should be prescribed by the State agent and, if possible, should be uniform throughout a given State, but not necessarily uniform throughout all the States. The following combinations are suggested by way of illustration:

Tomatoes and beans.
Tomatoes and peas.
Tomatoes and peppers.

Tomatoes and okra.
Tomatoes and beets.
Tomatoes and onions.

The county agent who selects a definite program and strictly carries it out will probably be more successful than the one who allows the girls to take up several crops.

Winter gardens can be started in the late summer and fall on from one-fourth to one-half of the tenth-acre plats. Lettuce, spinach, and kale can easily be grown on the same land that is used in summer for other vegetables.

The third-year girls should grow three crops. Generally, two of the crops should be the same as those grown during the second year. The third should be decided upon by the State and county agent and the third-year girls, and should be uniform throughout a whole community. This will permit of an opportunity to develop special resources in different sections. Of course the agents and the advanced girls will study the vegetables of their county thoroughly before they select and make a specialty of one which is to occupy one-third of the garden space

being managed by the third-year girls. Success can not be expected in this work by urging a great many varieties at one time. The question of variety will take care of itself after the girls have specialized on three different crops. It is really a large undertaking to have the girls master three crops in three years and standardize the products.

Of course, it is realized that it will be necessary for the girls to take care of a great deal of surplus fruits from the orchards at the same period that they are canning their demonstration garden products, but the experience acquired in putting up the vegetables will make them more capable of properly canning the fruits. In some sections it will be advisable to substitute from five to ten fruit trees for one of the vegetable crops. The club member will be responsible for the pruning, spraying, and general care of these trees. Perhaps it will be well in some sections to substitute a fruit for tomatoes after the first or second year, so that when the club girl reaches her fourth year in the work the plat will be set to perennials, a part of which will be in good bearing. The following combinations are suggested for the third-year work:

Tomatoes, beans, and okra.	Fig tomatoes, pepper, and okra.
Tomatoes, beans, and beets.	Tomatoes, pepper, and salsify.
Tomatoes, peas, and onions.	Tomatoes, pepper, and parsnips.
Fig tomatoes, onions, and cucumbers.	Beans, peas, and carrots.
Tomatoes, beans, and eggplant.	Cucumbers, pepper, and horse-radish.

Many other satisfactory combinations are possible. Before arranging a combination for any season it is necessary to consider the skill of the club members who are to do the work, the demands of the local market, and what vegetables are needed for the special products selected. A few products require four well-chosen vegetables. For instance, soup mixture and Creole sauce, demand tomatoes, peppers, okra, and onions; B. S. Chutney and Dixie relish each require Spanish peppers, fig tomatoes, cabbage, and onions. A good macedoine for salads and other purposes can be made from peas, carrots, string beans and young turnips, celery, or onions. It is hoped that the State and county agents will decide upon the crops for the second and third year girls just as early in the season as possible, enter the names of the selected crops upon the agent's record at the colleges, and report the same to the Office of Extension Work in the South.

The club members should gradually plant their tenth-acre gardens to crops of perennial vegetables and fruits. This line of endeavor should certainly begin at the end of the third year, and in many cases at the end of the second year. The perennials can be substituted for some of the annual vegetables and each girl can be given credit for the condition of the part of her garden containing the perennial. It is desirable to have the perennial rotation begin to bear fruit by the fourth year. By the time a club member gets the perennial crop well established in her garden she will probably be going to high school or college. Her little garden and orchard will be carefully looked after in her absence, because it will be a constant reminder to the others of the family of her energy, devotion, and perseverance. Such a garden will be kept as a lasting and much valued memorial. The following crops are suggested for a permanent garden on a tenth-acre plat:

Strawberries, asparagus, and cherries.	Dewberries, figs, and pecans.
Raspberries, rhubarb, and plums.	Currants, asparagus, and grapes.
Gooseberries, currants, and peaches.	Blackberries, figs, and scuppernongs.
Strawberries, asparagus, and quinces.	Strawberries, figs, and oranges.
Strawberries, rhubarb, and pears.	Asparagus, strawberries, and kumquats.

If the agents can induce the girls to establish several thousand gardens like these in five years' time, they will have established a great system of instruction through first-class object lessons and excellent demonstrators. Of course, in following such a system there will be much

teaching and practice in making preserves, jellies, marmalades, pickles, and similar products. (See fig. 1.) Also, there will be some purposeful manual training, because the girls will design and make baskets and boxes for containers of these products for the markets and for holiday and birthday gifts. Some beautiful baskets of this kind have already been made of native material. Incidentally, there will be some good work in sewing because the club members are making cup towels, holders, aprons, caps, and uniform dresses for use in the kitchens and on public occasions. The girls receive training in cooking by preparing some of their products for the home table.



FIG. 1.—Members of girls' canning club making strawberry and orange pectin jelly.

HOME DEMONSTRATION WORK.

The cooperative work carried on by the Office of Extension Work in the South and the State colleges of agriculture, has, from the beginning, emphasized the present plan of organization which provides for the efficient, devoted county woman agent employed for as long a term as possible and instructed and supervised by the State agent. The plan of personal leadership and supervision is the basis of successful work. The period of employment of the county agent has been so extended that many agents are now employed from 8 to 12 months in the year. The ideal plan now being striven for is to have a well-trained, efficient woman agent employed for the entire year in every county. Now that the worth of the work has been established and it has been sufficiently proved that it can not be successfully conducted without close supervision all the year, it is desirable for the future to get just as many counties

on this full-time-agent basis as possible, regardless of any extension of territory. In such counties, as soon as the girls' work shall have become well established and the agent's efficiency proved, demonstration work for women will be started. It is important that demonstration work for women be commenced as promptly as is consistent with thorough work, so that as funds become available from the Smith-Lever Act for the salaries of women agents, there shall be in existence a practical, well-established system of home demonstration work, with tabulated results from enough counties to show convincingly the soundness and worth of the plan.

It is assumed and understood that the mothers and the women generally will aid the girls in various phases of their work. The time has come in the process of the development of the demonstration organization when the women are eager to make some demonstrations themselves. Naturally they are much interested in the products put up by the girls and are studying with them the best means of utilizing such products. A county agent who has done one year's successful work can easily and readily go into the homes and aid in some cooking demonstrations which will give increased zest and interest to the work already done by the girls. The canned products in the home and the vegetables from the winter gardens should be utilized extensively in these demonstrations.

It is very desirable, however, that the women undertake some demonstrations of their own. It is worth while to select for their demonstrations some activities which are closely connected with the homes and which are difficult enough to require much skill and intelligence. The agents should always keep in mind that in any line of demonstration work they are simply trying to permanently raise standards and averages. To this end they must endeavor to find and extend the good practices already in use by the more successful people in the counties where they work. Agents should never assume an air of superiority but rather one of helpfulness, for they are teachers and are coaching demonstrators to do useful things for themselves and to help others.

The women demonstrators can well begin with chicken raising. It has been found that work with poultry is much better suited to women than to children. Poultry products are used very extensively in farm homes and there should be a large surplus for sale from every farm. Each agent should instruct her demonstrators in shipping by parcel post and express, using the most modern and inexpensive containers for such purposes. In the average community it will not be difficult to get 10 or 12 women to grade all the eggs they have to sell and then sell cooperatively. Egg-selling associations can be very quickly organized and put on a solid basis. Chickens make a good subject for demonstrations because of the probable profits and because the results can easily be put into statistical form for use in stressing and extending such demonstrations. It is always worth something for a demonstrator to be able to show a profit on the demonstration. The county agent will have an excellent opportunity to get a limited number of demonstrators to secure the same breed of chickens and by that means begin a gradual improvement of the stock of the whole community. It has been suggested that all products offered for sale by the women demonstrators bear the "5-H Brand" instead of the "4-H Brand" label, the additional "H" meaning home.

The following is quoted from a report of a Mississippi agent, and is typical of poultry work as being conducted by agents in several States:

When the blight struck our tomatoes and discouraged the girls it occurred to me that poultry, and particularly the cooperative egg-selling associations, would be profitable. So I obtained a list of 14 Farmers' Bulletins on poultry and wrote to the Department of Agriculture to send me 40 copies each. In about three weeks I received a mail sack, about 4 feet in length, filled with bulletins. These I distributed and began to talk poultry and cooperative egg selling. As a result, there are now 50 cooperative egg-selling associations and 2 junior poultry clubs.

One of these associations, with packing center at Centerville, has a membership of 17. At first the packing was done at the home of a member and the officers did the packing. Now a secretary-manager is paid 1½ cents per dozen to do the packing, which is done in a room of the old school building in town. This club has sold more than \$500 worth of eggs at prices ranging from 20 to 25 per cent above market prices.

Another association, with packing center at Woodville, has a membership of 20. The secretary-manager is paid 2 cents per dozen. To assist with the grading and packing the members are divided into committees of three, serving by turns. When first organized the packing was done at the dormitory of the A. H. S., but after the opening of school the room was needed, so the agent at the Yazoo & Mississippi Valley Railroad depot offered to share space with us, the depot being a large and roomy one. This association has an electric tester, scales for weighing the eggs, not accepting less weight than 2 ounces each, or 24 ounces per dozen.

At first shipments were made in the commercial cases with fillers. Now they are made in one-dozen cartons packed in commercial cases. Shipments are made by express, those made by parcel post not proving very satisfactory. This association ships both the fertile and infertile eggs, receiving a premium for infertile eggs. They have sold 3,815 dozens, at an average price of 24 cents a dozen.

Association No. 3, with packing center in the country 1 mile from Rosetta, has a membership of nine. The grading and packing is done at the home of the secretary-manager, assisted by committees. She is paid $1\frac{1}{2}$ cents per dozen. Most of the eggs go to New Orleans.

The other groups have had somewhat similar experiences.

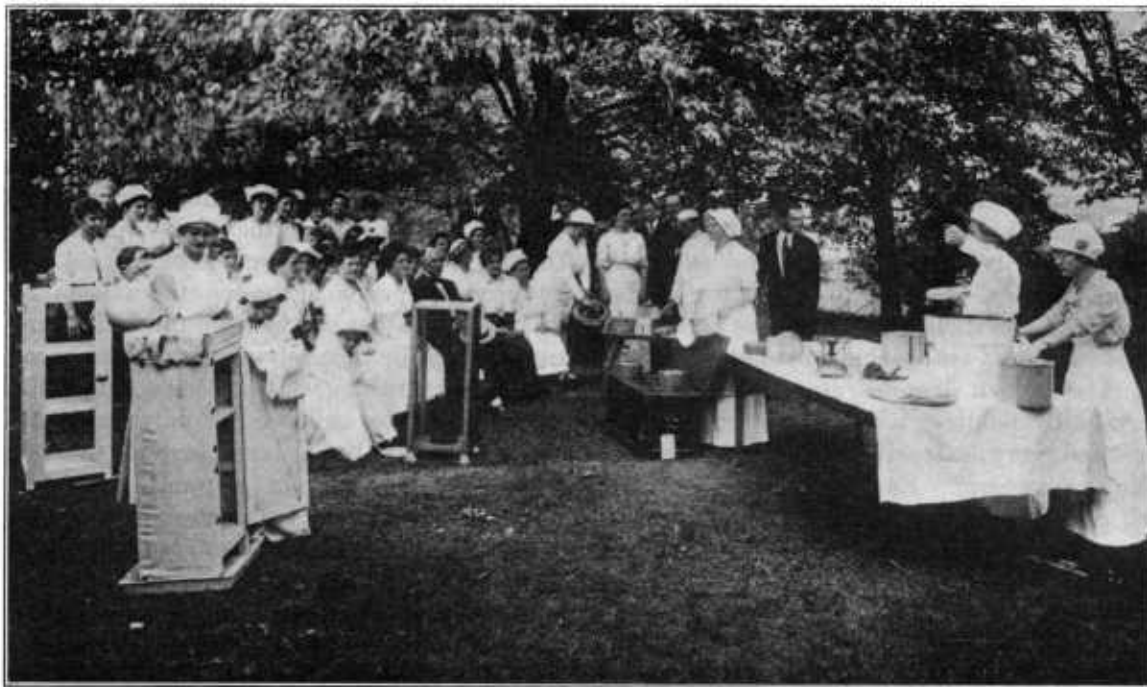


FIG. 2.—A meeting of women agents at which the various home-constructed conveniences and labor-saving devices are being explained. (The model of an iceless refrigerator in the left-hand foreground of the picture was designed by Professor Fullam of Alabama.)

In cooking and serving the products grown by the girls and women, there is a need for simple demonstrations in improved kitchen equipment and utensils. The fireless cooker has been one of the first devices to be used in this connection. Every agent should know how to make an effective fireless cooker at small cost. She should know, also, where to secure an inexpensive and successful stove which will not cost much, but which will enable the housewife to heat the food and the soapstones or disks, to be put into the fireless cooker, without the necessity of building a hot wood or coal fire, especially in the summer time. Some of our agents have already made these cookers and have given demonstrations in cooking creole chicken, thus utilizing some of the canned vegetables put up by the girls, and at the same time explaining the proper cooking of meats.

Just as soon as the demonstrations have been made in cooking meats and vegetables there will be a demand for some similar work with bread. A great field of work will open up when the subject of teaching bread making is reached. A progressive agent will be an expert along

that line and she will be able to give advice in regard to inexpensive bread mixers, kitchen cabinets, and such things as will save labor and increase efficiency.

In many instances the first approach to problems of sanitation from a demonstration standpoint has been made in the preparation for the canning parties or demonstrations held at the homes of club members. The need for absolute cleanliness and sterilization in canning is vividly impressed, because measured by speedy success or failure. Following such demonstrations it is far easier to spread the use of sanitary measures with reference to milk, water, and protection of other foods and the results are more tangible and impressive than when the subject of sanitation is attacked directly without such preliminaries. There must always be a definite activity to begin with, and the wisdom of its choice is measured partly by immediate results and further by the extent to which it stimulates other activity and arouses thought and initiative on the part of demonstrators in their homes. County agents in the South have found a splendid means of attacking the menacing fly by the use of home-constructed flytraps, in which thousands of this pest are destroyed early in the season. This simple device attracts considerable attention and because of its success stimulates further preventive measures in the destruction of the larvæ of flies in their breeding places. Subsequently it is not difficult to have the doors and windows screened, to have continued the use of ingenious flytraps to catch the few flies that get into the house in spite of the screens, and also to have the greatest care exercised in the disposition of garbage and filth.

Logically the next step will be with the care of milk and butter, another important demonstration subject. This is a line of work where great improvement is needed, and the number of housekeepers whose methods may be held up as standards is relatively smaller than in any other phase of demonstration work. There are great opportunities for financial success in dairy work, depending, however, upon the use of good methods. At this point considerable instruction in regard to cleanliness and sanitation will be found necessary. Improved churns, butter molds, cleaning devices, such as dishwashers, vacuum cleaners, and other conveniences, will be introduced.

While the above program is being carried out, a progressive agent will find frequent opportunity to gain the confidence of her demonstrators by suggesting many useful devices and utensils, which are inexpensive and can frequently be made by the men and boys in the homes. (See fig. 2.) An ironing board, fastened to the wall at the top of the wainscoting with a hinge and with a folding leg to support it when in use, and a button to fasten it up to the side of the wall when not in use, can be easily made and a good sleeve board can be added. Some will learn about kerosene, gasoline, or carbon flatirons, dishwashers, cherry seeders, patent parers for apples, peaches, and other fruit, clothes washers and wringers, and will get them for their kitchens. Iceless refrigerators (see fig. 3), wheel trays, built-in kitchen cabi-



FIG. 3.—A model of an iceless refrigerator of simple construction, such as could be used to advantage in many country homes.

nets, and many other conveniences, which are very much needed and which have been thus far neglected are being made by demonstrators. When the agents in general promote these things, many manufacturers will start to work along the same lines. Bright and ingenious minds will devise other conveniences and utensils. It will be worth much to have thousands of minds focused on the question of improved and labor-saving devices for use in the home.

It is very important to have each demonstrator make a start and carry out some useful and profitable line of work. Success with one demonstration creates a desire to undertake others. Under the direction of the county women agents in a few counties inexpensive home water systems have recently been installed in from 10 to 15 country homes. Reports have also been made of the building of a few septic tanks. It will not be long before many other

agents will be able to get demonstrators to install water systems. No line of this home demonstration work is more important than to get running water into the country homes. It is worth while, therefore, for each agent to inform herself in regard to inexpensive and effective plans of establishing water systems under different conditions. (See fig. 4.)

In a short time the county agent will be called upon to make suggestions in regard to the selection, construction, and arrangement of furniture. In a short time, too, she will be called upon by farmers and their wives for help in planning their houses and surroundings. Agents must also know where to get additional information on these various subjects. To do their best home demonstration, agents must possess much valuable knowledge about home buildings, home conveniences, and home beautification.

When a demonstrator succeeds with two or three of the things herein outlined, she will naturally find other useful things to do. The tendency of the whole program is to bring about the improvement and beautification of the home and its surroundings. Although we may have in mind the desirability of making the homes attractive and making the people anxious to remain at the old

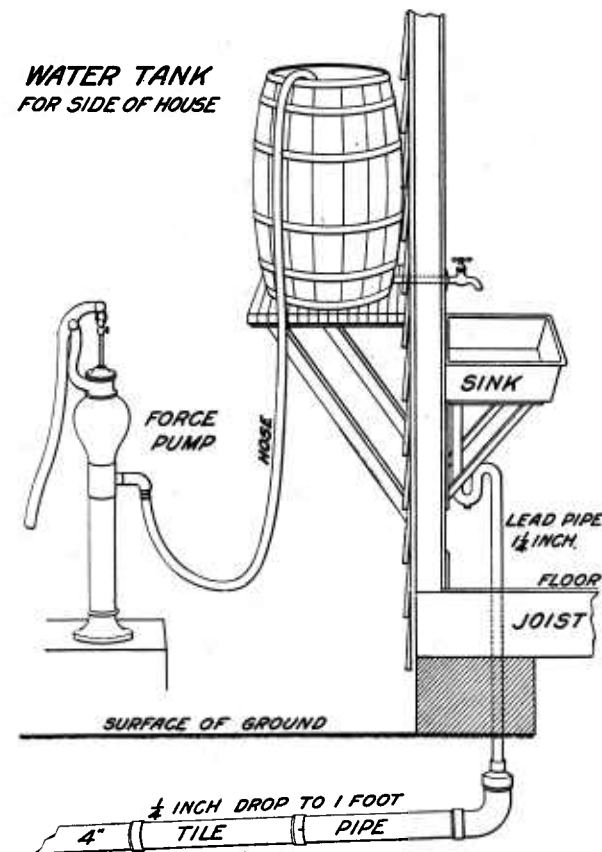


FIG. 4.—Diagram of a home water system of simple construction and great convenience.

homesteads and improve them, we can accomplish this only by taking one step at a time. One success leads to another. We can achieve the ultimate object easier step by step than we can by trying to do all of these things at once.

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MARY E. CRESWELL,

Assistant in Home Demonstration Work.

Approved:

BRADFORD KNAPP, *Chief.*

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

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STATES RELATIONS SERVICE,
OFFICE OF EXTENSION WORK, SOUTH,
(Farmers' Cooperative Demonstration Work),
WASHINGTON, D. C.

DEVELOPMENT OF THE BOYS' CLUB WORK.

The members of the Boys' Corn Clubs in the Southern States have made demonstrations beneficial to their communities at a time when great damage was being done by the cotton-boll weevil. Their object lessons have been equally potent during the period of depression incident to the European war and low-priced cotton. The boys who joined these clubs during the first year expressed a desire to be demonstrators because of the success of their fathers as such. So many thousands of boys have followed the example of the pioneers in club demonstrations that nearly every community in the South has had its boy champion, whose influence has spread for miles around. Many a manly, ambitious boy has formed new purposes and started out with a broader vision and brighter purpose because of his local success. The object lessons furnished by the State prize winners have attracted the attention not only of the Nation but of the whole world.

Boys' Corn Clubs have been conducted in the Southern States for six years by the United States Department of Agriculture, the agricultural colleges, and other cooperating agencies. During this time 1,751 boys have each produced more than 100 bushels of corn to the acre. Of that number, 26 each produced more than 200 bushels per acre. Some of the most conspicuous records are:

Record of seven boys producing over 200 bushels of corn per acre.

Name of club member.	State.	Yield per acre.	Cost of pro- duction per bushel.
		<i>Bushels.</i>	<i>Cents.</i>
Jerry Moore.....	South Carolina.....	228 $\frac{1}{2}$	42.0
Junius Hill.....	Alabama.....	212 $\frac{1}{2}$	8.6
Eber Kimbrough.....	do.....	224 $\frac{1}{2}$	19.8
Ben Leath.....	Georgia.....	214 $\frac{3}{4}$	14.2
J. Jones Polk.....	Mississippi.....	214 $\frac{9}{10}$	21.4
Bennie Beeson.....	do.....	227 $\frac{1}{2}$	14.0
Walker Lee Dunson.....	Alabama.....	232 $\frac{7}{10}$	19.9

It is interesting to note the following statistics in regard to the 100-bushel boys.

*Number of corn club members in the Southern States who have raised 100 or more bushels of corn
to the acre each year from 1909 to 1914, inclusive.*

1909.....	52	1913.....	374
1910.....	171	1914.....	354
1911.....	327		
1912.....	493	Total.....	1,771

The opportunities are just as great now as ever for these and other boys to make similar reputations for themselves and for their States. The needs are just as urgent and the possibilities are greater. It is simply a matter of the club members using the knowledge and training which they have received in the proper development and expansion of the good work which they have already begun.

PLANNING THE WORK.

All good farming must be carefully planned. The time has come in the boys' club work when there must be a continuing program. There must be gradation, adaptation, and rotation. While there will necessarily be some variation and diversification in the crops grown in the different States, there should also be unity and harmony in the general plan of work undertaken in all of the States. While the corn club boys from Maryland to Texas have been working under a great variety of conditions and diversity of climate, there has been an elbow touch and a unity of purpose throughout the whole organization. It is very essential that these things be preserved in the evolution of a general plan and in its administration.

Nearly 60,000 boys enrolled in the boys' clubs for 1915. Each one of these boys had an acre in corn, or such crops as kafir, milo, and feterita, which are substitutes for corn in western Texas and Oklahoma. Every one of these boys should own, feed, and care for one or more farm animals. Club members should demonstrate the growing of pigs, calves, colts, lambs, and kids, depending upon the demands, conditions, and needs in various sections and localities. Of course, it will be all right for a group of boys to organize themselves into a pig club or a baby-beef club if they wish to. However, that organization should not be detached from the general plan of boys' farm clubs for a whole county or State.

SOIL BUILDING AND ANIMAL FEEDING.

The club members who have grown their acres of corn and secured their live stock should immediately take up the question of how best to use the acre of land which has been in corn and also how to feed their live stock most economically. They should practice soil building and animal feeding. Whatever animals a boy may own, some good grazing will have to be provided. The boys who are growing pigs would make a great mistake if they were to pen up the pigs and feed away the corn to them. It would not be a balanced ration for the pigs and the meat would cost more than it could be sold for. The acres which have been in corn should be seeded to small grain or legumes. In some sections it will be better to sow the acre to a cover crop for grazing and to be turned under in the spring. Following this treatment, prize acres of cowpeas, soy beans, or peanuts might be grown. In other sections it will be advisable to seed together such crops as rye and crimson clover, rye and bur clover, or vetch and oats. Hundreds of boys in some of the States have already made fine demonstrations with crimson clover. They have taken more pains with the inoculation than the average adult farmer does. The result is that they have taught the important lesson of soil inoculation in their communities. Perhaps it would be a good idea for a boy to put one-fourth of his acre in clover or vetch and the remainder in rye, oats, barley, or wheat. If he decides to plant clover, only a small area should be undertaken until inoculation is secured. Inasmuch as he is manipulating this acre for the sake of feeding his live stock and of improving the soil he might further subdivide it and put one-fourth of an acre in rape or some other crop to be used exclusively for grazing purposes. In counties where potato clubs are undertaken, one-eighth of the acre can well be devoted to potatoes. Summer legumes and annual grasses for pasture, hay, and humus will be in order for the remainder of the acre or the whole acre after the winter crops are taken off. When this acre is put into corn again in the rotation, the boy will have a fine opportunity to observe the effects of the different crops on the improvement of the soil. Under this plan boys who make large yields will

doubtless be able to repeat on the same acre. It should be a matter for serious thought that the boys who have produced the large yields have not been able to "come back," when they use the same land the second year. By following a simple two-year rotation, combined with live stock feeding, the boys will continue to get large yields and at a low cost.

There are several thousand boys in the 15 Southern States who are members of the pig clubs. Under the stimulation and encouragement of public-spirited business men, some of these boys have started into the hog business without having grown any crops to feed the pigs. Every one of these boys should promptly select his acre and begin with the small-grain and legume crops. He should have some grazing for his pigs just as soon as possible. He has really entered the farm club work without passing through the first grade. He may, however, join the classes at the stage of advancement, for he will get an opportunity to do the corn club work when the class takes up that subject again. By growing his pig and his feed crops the land is prepared for good work with corn during the second year of his club membership.

ROTATION AND DIVERSIFICATION OF CROPS.

The smaller boys, during the first two years of their membership in the clubs, will have enough to do to handle one acre at a time and care for their live stock. It will be better for these boys to exchange small grain, hay, cowpeas, clover seed, or some of their other crops for enough corn to feed their live stock than to overcrop themselves by farming two or three acres just for a limited amount of corn. Some of them might grow just enough corn for feeding purposes, but the average boy, by helping his father with the larger crop of the farm, can get feed corn for one year in exchange for his labor and help. It will be good training for the boys to use their intelligence and resourcefulness along this line. It is more important to demonstrate profitable soil building and animal feeding in the South now than it is to try to make large yields of corn every year, especially as the corn demonstrations in the rotations will be so much more effective. The older and more advanced boys might farm two acres at a time. One acre will be in corn while the other is in small grain and legumes. Of course, the crops on these acres will alternate. In this way a boy might compete for corn club prizes every year, but it is recommended that prizes be offered also for the live stock, for the legumes, and for the small grain. If the club member uses his small-grain crop for grazing and for turning under, he can compete for prizes on such crops as peanuts, beans, peas, and lespedeza. There are hundreds of communities, throughout the South, where prizes on these crops and on crimson and bur clover and vetch would do a vast amount of good. Club members have a fine opportunity to demonstrate the best methods of harvesting seed from such crops. They can make a fine profit on such enterprises. Prizes might be offered for yields of seed and also for hay. Where prizes are offered for the production of small-grain crops, the club members should see to it that the summer legume crops following are plowed under for soil improvement.

In semiarid sections this program will have to be still further modified and adapted to climatic conditions. Corn, if planted at all, may be alternated with peas or soy beans. The small-grain crops may be emphasized to good advantage. Club members in such sections can do some fine demonstration work with kafir, milo, and other corn substitutes, and in live-stock feeding.

BENEFITS, HONORS, AND AWARDS.

Toward the close of the second year, in most sections, preparation should be made to plant the acre to corn again. A club member who has followed this plan for two years will know a great deal more about corn production and farming in general than he did when he was a freshman in the work. He will doubtless be able to make a fine yield at a low cost of production and the quality of his corn should be greatly improved. He will be better able to write a history of

his crop which will reveal his knowledge of the whole plan of work which he has been following for three years. At the close of the third year he may repeat his rotation if he expects to remain in the club, but most of the boys will be going away to high school or college after they have done three years' work. It is recommended, therefore, that the boy prepare his acre thoroughly and seed it to perennial clovers and grasses or alfalfa. Such a course carefully followed and such a piece of work thoroughly done will make the club member a benefactor in his community even after he has left home to better prepare himself for further service to his fellows. He will leave a worthy memorial to his perseverance and skill which will also be a magnet to draw him back to the farm.

It will be a good idea to award a certificate of recognition, honor, and distinction to every boy who completes three years' work. Such a certificate should be signed by the highest authorities of the colleges and States and should be awarded at a public meeting of the whole county boy's farm clubs. All corn club members with 100-bushel records, at limited cost, should continue to receive diplomas and badges as "All-star club members." Great care should be exercised in establishing and proving such yields.

DUTIES OF CLUB AGENTS AND COUNTY AGENTS.

In view of the varying conditions existing in the several States, the responsibility for the selection of the different crops under this plan and for the detailed instruction of the club members must rest with the State club agents and the various county agents. It will be necessary to work the matter out carefully for every county. The club agents and the county agents should prescribe the course in the county and have the club members compete in carrying it out. Of course progressive school officers, teachers, and business men will cooperate as heretofore in helping and encouraging the boys in their worthy enterprises.

This is demonstration and not experiment work. The boys should have such advice and aid as will practically insure success with proper effort. Frequent letters and frequent visits will be necessary. These should come from State and county agents. Of course the college and department authorities will cooperate in every possible way to help the club members.

O. B. MARTIN,

Assistant in Charge Demonstration Club Work.

Approved:

BRADFORD KNAPP, *Chief.*

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**SOME HOME CANNING DIFFICULTIES AND HOW TO AVOID THEM.**

By O. H. BENSON, *In Charge Boys' and Girls' Club Work*, and GEORGE E. FARRELL, *Assistant in Boys' and Girls' Club Work*.

[This circular is a part of the series of follow-up instructions used in the home canning club work in the Northern and Western States, the complete series including NR-21, NR-22, NR-23, NR-24, NR-25, NR-26, NR-28, NR-29, NR-30.]

FLAT SOUR AND SPOILAGE IN CORN AND PEAS.

Canned corn and peas (as well as beans and asparagus) may show no signs of spoilage and still when opened have a sour taste and a disagreeable odor. This specific trouble is known to the canner as "flat-sour," and can be avoided if the canner will use fresh product; that is, one which has not been gathered more than 5 or 6 hours, and will blanch, cold-dip, and pack one jar of product at a time, and place each jar in the canner as it is packed. The first jars in will not be affected by the extra cooking. When the steam-pressure canner is used the jars or cans may be placed in the retort and the cover placed in position but not clamped down until the retort is filled. Rapid cooling of the products prevents overcooking, clarifies the liquid, and preserves the shape and texture.

Corn.—Corn seems to give the club member the most trouble, but with a little care and study this product may be canned as easily as any other grown in the garden. A little experience in selecting the ear and ability to recognize corn that is just between the milk and the dough stage are important. Blanch not longer than 5 minutes and then cold-dip (for which purpose a plunge in cold water is sufficient). Cut the corn from the cob with a sharp knife and put it at once into sterilized jars. As the corn expands a little in processing the jars should not be filled quite full. Best results can be accomplished when two persons cut and one person fills. If it is necessary for one person to work alone, cut off sufficient corn to fill one jar, pour on boiling water, add salt, place the rubber and the cap in position, and put the jar at once into the canner. A little overcooking does not injure the quality of canned corn. Corn that has a cheesy appearance after canning had reached the dough stage before being packed. Corn should never be allowed to remain in the cold-dip, and large quantities should not be dipped at one time unless sufficient help is available to handle the product quickly. Water-logged or soaked corn indicates slow and improper packing.

Peas.—When peas are keeping well but the liquid shows a cloudy or hazy appearance, it indicates that the product was roughly handled in blanching and cold-dipping, or that split or broken peas were not removed before packing. When peas are too old and blanching is not carefully done the skins crack and the liquid becomes cloudy. Some waters of peculiar mineral content have a tendency to increase cloudiness.

FADED BEETS.

Small beets that run 40 to the quart are less likely to fade and are the most suitable size for first-class packs. The older the beet the more chance there is for loss of color. When preparing the beets leave on 1 inch of the stem and all of the tail while blanching. Blanch not more than 5 minutes and cold-dip. The skin should be scraped from the beet, not peeled. Beets should be packed whole, if possible. Well-canned beets will show a slight loss of color when removed from the canner, but will brighten up in a few days.

SHRINKAGE.

Shrinkage may occur during sterilizing from the following causes:

1. Improper blanching and cold dipping.
2. Careless packing, poor grading.
3. Sterilizing for too long a period.
4. Lack of judgment in the amount and size of product put into the container.

Shrinkage of greens or potherbs during the canning process is usually due to insufficient blanching. The proper way to blanch all greens or potherbs is in a steamer or in a vessel improvised to do the blanching in live steam above the water line. If this is done a high percentage of mineral salts and volatile oil is retained by the product.

DIFFICULTIES IN THE OPERATION OF CANNING OUTFITS.

The inexperienced frequently encounter difficulties, particularly loss of liquid from the containers, as a result of improper operation of the canning outfit used.

Hot-water bath outfit.—The following rules will help to avoid difficulties in the operation of this type of canning outfit:

1. Support the jars on a perforated platform sufficiently to permit the free circulation of water under, among, and around the jars. Towels, excelsior, newspapers, hay, and the like are unsatisfactory.
2. Have the water cover the tops of the jars by at least 1 inch.
3. Count time as soon as the water begins to *jump* over the entire surface.
4. Remove the jars from the water and tighten the covers as soon as the time is up.

Steam-pressure canner.—To secure the best results in the operation of the steam-pressure canner the following precautions should be observed:

1. Place each jar in the canner as soon as packed.
2. Have the water come to, but not above, the platform.
3. Have the canner absolutely steam tight.
4. When the canner has been filled, fasten the opposite clamps moderately tight. When this has been done, tighten each clamp fully.
5. Allow the pet cock to remain open until live steam blows from it.
6. Close the pet cock, allowing just a trace of steam to escape.
7. Force the pressure to the required point before counting time.
8. Maintain a uniform pressure during the sterilizing period. Fluctuations of pressure, such as running it up to 12 pounds, down to 7 pounds, and back to 10 pounds, cause loss of liquid from the containers.
9. Allow the canner to cool before opening the pet cock. Blowing the steam from the pet cock at the close of the sterilizing period is likely to cause a loss of liquid.
10. Have the pet cock completely closed during the cooling.
11. Open the pet cock before vacuum forms. A vacuum is shown by a rush of air into the canner when the pet cock is open. You can test this by placing the finger over the end of the pet cock. If a vacuum has formed it will draw the flesh of the finger into the opening. The formation of a vacuum is objectionable because it may result in loss of liquid from the container.
12. Remove the jars from the canner and tighten the lids as soon as the canner is opened. The wire bails on glass-top jars should not be so loose that they will not go in with a snap.

MOLD ON CANNED GOODS.

Mold may develop on canned goods:

1. If the seal is defective.
2. If, after sterilizing, the tops are removed from the jars to replace the rubber ring. The jars should be returned to the canner for at least 5 minutes when this is done.
3. If the jars are kept in a damp place where the rubbers may decompose, mold may enter through these decomposed rubbers.

DIFFICULTIES DUE TO IMPROPER SIRUP DENSITY.

Unsatisfactory results frequently follow from the use of sirups which are not of the density best suited to the particular purpose for which they are employed. The following table gives the proportions of sugar and water required to prepare sirup of any desired density. No allowance has been made for evaporation.

Proportions of sugar and water in sirup of different density.

Desired sirup density.	Amount of sugar.	Amount of water.	Desired sirup density.	Amount of sugar.	Amount of water.
<i>Per cent.</i>	<i>Pounds.</i>	<i>Quarts.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Quarts.</i>
12	1½	5½	35	7	6½
15	3	8½	40	2	1½
18	4½	10½	50	2	1
24	6	9½	60	6	2
28	7	9	64	16	4½

BREAKAGE OF JARS.

When breakage of jars occurs it is due to such causes as:

1. Overpacking the jars. Corn, pumpkin, peas, lima beans, and sweet potatoes swell or expand in processing. Do not fill the jars quite full of these products.
2. Placing the cold jars in hot water, or vice versa. As soon as the jars are filled with hot sirup or hot water, place them immediately in the canner.
3. In a steam canner having too much water in the canner. The water should not come above the platform.
4. Allowing a cold draft to strike the jars when they are removed from the canner.
5. Having the wire bail on glass-top jars too tight, thus breaking the jars when the lever is forced down.

DEFECTIVE JARS.

To detect defects in screw-top jars:

1. Place the top on the jar without the rubber. Turn it down tight. If the thumb-nail can be inserted between the top and the glass, the top is usually defective.
2. Place the rubber and the cap in position and screw them down lightly. Pull the rubber from its position. Release it. If the rubber returns to its position between the top and the jar, the top is defective.

To detect defects in glass-top jars:

1. Place the glass top on the jar without the rubber. Tap around the outer edge of the top with the finger. If the top rocks, it is defective.
2. Put the wire bail into place over the top of the cover. If it does not go in with a snap, even when the tightening lever or the clamp spring is up, remove it from the tightening lever and bend it to make it tight. This tightening of the bail should be done every year before using.

HOW TO TELL GOOD RUBBERS.

A good rubber will stand considerable pulling and jerking and will return to its original shape. A good rubber will also stand several hours of boiling in a hot-water bath outfit without being affected.

ARE TIN CANS SUITED TO HOME CANNING?

If the raw food products intended for canning are in sound condition; if the proper sanitary precautions are observed, and the one-period cold-pack method is strictly followed (as described in NR-24 of this series of circulars), it is entirely safe and practical to use tin cans for all kinds of fruits, vegetables, and other food products. It is true that canned foods may be rendered unfit for use through improper handling of the product before packing and that decomposition may occur after canning owing to insufficient processing, improper sealing, or the use of leaky containers. This condition, however, is no more likely to be encountered in foods put up in tin than in products canned in other types of containers. Most canned foods which are in a spoiled condition readily show this condition through the swelling of the can or by odor or taste. Canned foods showing such evidences of decomposition should of course not be used. Certain foods which are high in protein, such as meats, peas, beans, and fish products, may undergo decomposition without making this condition obvious to the senses. It is therefore essential that the greatest care be taken to subject such products to ample processing in the course of preparation. It should be remembered that canned foods, after opening the containers, should be treated as perishable products and should be handled with the same precautions that are applied to fresh products.

BAD EFFECTS OF TOO MUCH SALT.

Most vegetables as well as meats are injured in flavor and quality by an excessive use of salt for seasoning in the canning process. A little salt is very palatable, and its use should be encouraged, but it is better to add no salt in canning than to use too much. It can be added to suit the taste when canned goods are served.

WATER FOR HOME CANNING.

Water used for home canning should be pure, soft, and as free from sediment and excessive mineral content as possible. Clear drinking water is generally usable. Softening, hardening, or discoloration of vegetables because of the character of the water is an exception to the rule in home canning.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**SEED AND PLANTS FOR THE HOME GARDEN.****TO SUPPLY VEGETABLES FOR A FAMILY OF FOUR PERSONS.**

Prepared by C. P. CLOSE, *Extension Specialist in Horticulture and Pomology.*

There is no part of the home food supply which adds so much to the health, happiness, and satisfaction of the whole family as a generous supply of cool, crisp vegetables right out of the family garden. In general, no other equal area of land and no equal amount of work will bring such rich returns in food value as that devoted to this same little garden. The suggestions in this circular refer to the possible requirements of a family of four persons; larger families will require correspondingly more, and smaller families correspondingly less.

If vegetables are desired for home canning, the amounts of seed mentioned later should be increased, and the garden space at least doubled. This will make possible "a winter garden" through a full storeroom of canned vegetables. Send for NR-Series on Home Canning Instructions for your guidance.

The first thing to do right now is to plant seeds of early tomatoes and early cabbage in a seed box (see fig. 1) in the house so the plants will be ready to set out of doors when the weather is warm enough. If a few cauliflower and pepper plants are desired, seeds of these may be planted also. Two or three dozen early tomato plants, three or four dozen early cabbage plants, two or three dozen cauliflower plants, and ten or twelve pepper plants, will at least be required. This refers to the early garden only.

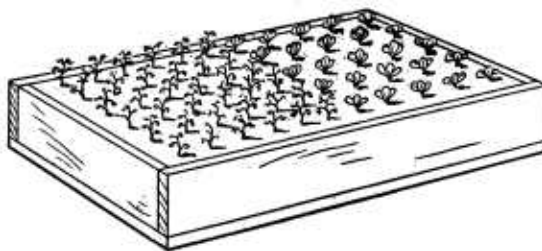


FIG. 1.—Seed box for growing vegetable plants. Dimensions: 3-4 inches deep, 12-14 inches wide, and 20-24 inches long.

MAKING A SEED BOX.

Seeds of these four vegetables should be planted in a seed box (fig. 1) in the house at once. The seed box should be 3 to 4 inches deep, 12 to 14 inches wide, and 20 to 24 inches long. A layer of about one inch of gravel or cinders should be placed in the bottom of the box, then it should be filled nearly full of rich garden soil, or soil enriched with decayed leaves or manure. The rich soil beneath the family wood pile or around decaying logs is splendid for this purpose. The soil should be pressed down firmly with a small piece of board and rows made $\frac{1}{4}$ to $\frac{1}{2}$ inch deep and 2 inches apart crosswise of the box. The seed should be distributed 8 or 10 to the inch in the rows and be covered. The soil should be watered and the box set in a warm place in the light, in the sunshine by a window being best. Water enough must be given from time

to time to cause the seeds to germinate and grow thriftily, but not enough to leak through the box. If a piece of glass is used to cover the box, it will hold the moisture in the soil and hasten the early growth of the plants.

TAKE OUT SURPLUS PLANTS.

When the plants are from an inch to an inch and a half high, they should be thinned to one or two inches apart in the row so as to give them space enough to make a strong stocky growth. If it is desired to keep the plants which are thinned out, they may be set 2 inches apart each way, in other boxes prepared as mentioned for the seed box. When the weather becomes mild, the box of plants should be set out of doors part of the time so that the plants will "harden off" in preparation for transplanting to the garden later. A good watering should be given just before the plants are taken out of the box for transplanting so that a large ball of earth will stick to the roots of each one.

AMOUNTS OF SEED OF DIFFERENT VEGETABLES FOR A FAMILY OF FOUR.

The vegetable seed for planting in the garden later *should be ordered at once*, so that garden making will not be delayed when the weather has warmed up sufficiently to begin operations. The following amounts of seed are suggested and the first list of these given will plant approximately 100 feet of row:

Beans, snap.....	1 pint.	Eggplant.....	1 packet.
Beans, pole lima.....	$\frac{1}{2}$ pint.	Kale, or Swiss chard.....	$\frac{1}{2}$ ounce.
Beans, bush lima.....	$\frac{1}{2}$ pint to 1 pint.	Parsley.....	1 packet.
Cabbage, early.....	$\frac{1}{2}$ ounce.	Parsnips.....	$\frac{1}{2}$ ounce.
Carrot.....	1 ounce.	Salsify.....	1 ounce.
Cauliflower.....	1 packet.	Squash, summer.....	$\frac{1}{2}$ ounce.
Celery.....	1 packet.	Squash, Hubbard type.....	$\frac{1}{2}$ ounce.
Cucumber.....	$\frac{1}{2}$ ounce.		

The following vegetables will undoubtedly be planted in larger amounts than those just mentioned, and the amounts of seed given will be a guide for ordinary requirements. Some families may need more of the various vegetables and others would need less:

Beet.....	4 ounces.	Peas, garden.....	2 to 4 quarts.
Cabbage, late.....	$\frac{1}{2}$ ounce to 1 ounce.	Radish.....	1 to 2 ounces.
Corn, sweet.....	1 pint.	Spinach.....	$\frac{1}{2}$ pound in spring and $\frac{1}{2}$ pound in fall.
Lettuce.....	1 ounce.	Tomatoes, late....	$\frac{1}{2}$ ounce.
Muskmelon.....	1 ounce.	Turnips.....	$\frac{1}{2}$ pound.
Onion sets.....	2 quarts.	Watermelon.....	1 ounce.

The string beans, bush lima beans, sweet corn, lettuce, peas, and radishes will not all be planted at one time, but successive plantings two to three weeks apart will be made, so as to have a fresh supply throughout the season.

Of early Irish potatoes, 1 peck to one-half bushel will be required, and of late potatoes one-half bushel to 1 bushel or more, depending upon the amount of ground available for this purpose. If possible, enough Irish potatoes should be grown to last throughout the winter.

This circular will be followed immediately by others giving instructions on planning the garden, planting the seeds, caring for the plants, growing succession crops, and home use of vegetables.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
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STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

PLANT A GARDEN.

The family living can be improved and the cost reduced by having a good garden.



FIG. 1.—A farm garden promising abundance and variety for the table.

Why not

A better garden with more canned and stored vegetables on every farm?

A garden in the back yard?

Vacant town lots cleaned, prepared, protected, and planted to vegetables?

A pantry full of food supplied by the garden in every home the coming winter?

PLAN FOR A GARDEN.

GET READY FOR THE GARDEN NOW.

Plant tomato and cabbage seed now in window boxes or cold frames.

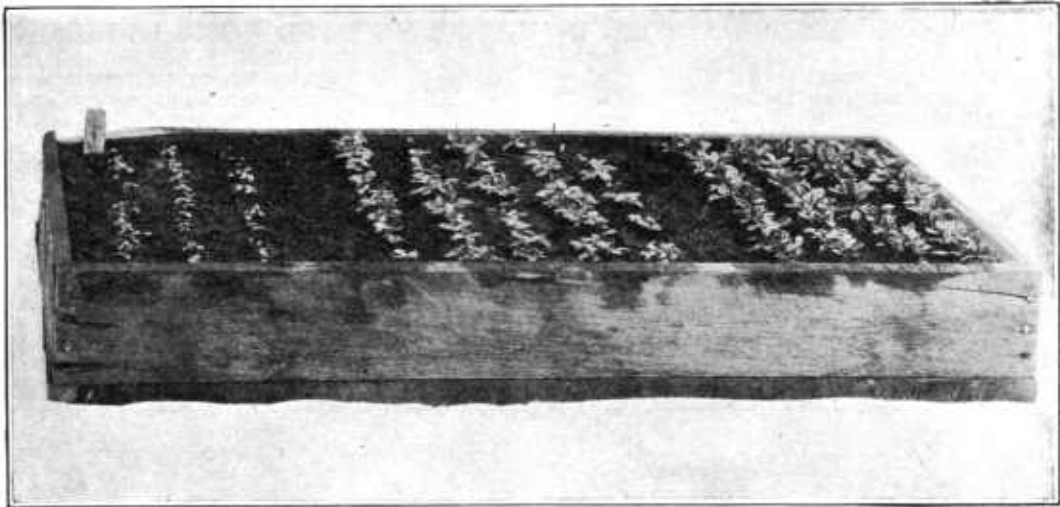


FIG. 2.—Seed box in which vegetable plants are being grown for transplanting.

Now is the time—

To buy your garden seed.

To get your manure or fertilizers.

To clean up the garden.

Don't wait for the warm weather.

Plan the garden on paper.—You can grow more on the same land that way. Make it a matter of family counsel, then all will be interested in it and help to make it a success.



FIG. 3.—A home garden tended by children.

Plan to plant and to replant.—Make the garden work all summer and fall. Get ready now; don't wait.

See that your fall garden plans call for the staple storage vegetables like potatoes, onions, beets, squashes, and the like.

CAN THE SURPLUS FOR WINTER.

It is easy to can early vegetables and when canned they are always ready for the table. You can can peas, corn, early carrots, and beets, tomatoes, spinach; dandelions and other wild greens.

Don't fail to gather in season and can the wild things—like wild mustard, cowslips, pokeberry, etc.—they are wholesome food.

Rapid "One Period Cold Pack" canning directions can be secured upon request.

GROW A PLENTY.

Eat vegetables in season. Can the surplus.



FIG. 4.—A mother-daughter canning club team.



FIG. 5.—A successful boys' club garden.

Save the wastes of orchard, field, and garden by the new, easy home canning methods. Practice thrift through production and food conservation. The better the garden, the more saved for other comforts.

MAKE THE HOME GARDEN A FAMILY MATTER.

The men and older boys will desire to do the heavy work.

The women and girls want to help in the work for more and cheaper food.

Every one in the family has a part in the garden program. It is a family job.



FIG. 6.—Girls' canning clubs help in the work for more and cheaper food.

LET THE BOYS AND GIRLS JOIN A GARDEN AND CANNING CLUB.

Write your county agricultural agent or the extension director of your agricultural college for instructions and literature on boys' and girls' clubs and home garden making.

From the United States Department of Agriculture you can get other garden and canning literature.



NR-3.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS AND GIRLS CLUB WORK.

HOME GARDENS.

VEGETABLES TO GROW AND HOW TO GROW THEM.

By C. P. CLOSE, *Horticulturist and Pomologist in Extension Service, Bureau of Plant Industry.*

GARDEN PLAN.

In preparing for a garden one should have a well-defined plan to follow. The plan will vary with the kind of plants to be grown, the size of plat available, the section of country, and to some extent with the kind of soil. The small plants like carrots, parsnips, beets, lettuce, etc., may well be grouped in adjacent rows because they need much the same treatment and the

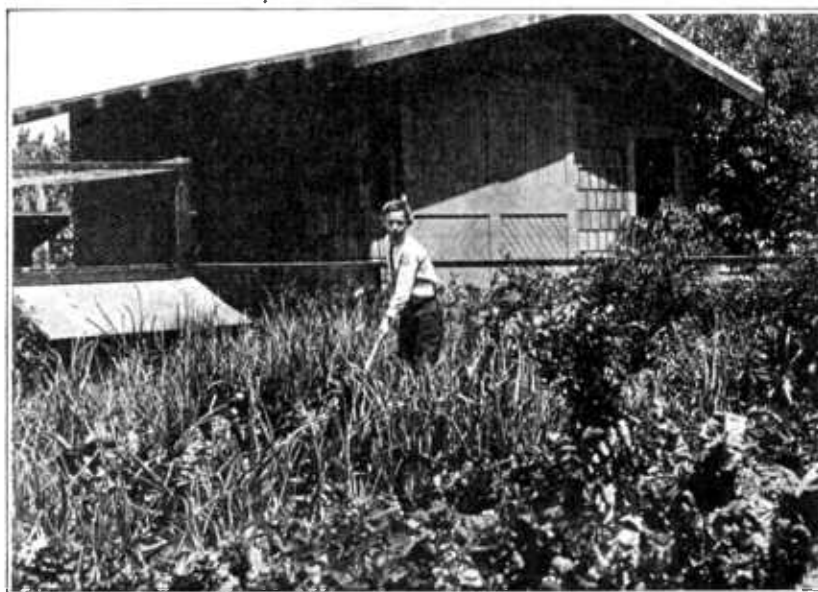


FIG. 1.—Vegetables for the whole year from this well-arranged home garden. Courtesy California Club Work.

rows may be close together. Potatoes and sweet corn go well together, as they need about the same amount of space. Melons, cucumbers, etc., should be grouped together. Perennial plants like asparagus and rhubarb should occupy a side or end of the garden. Figure 1 shows a well arranged home garden.

KIND OF SOIL.

A good garden can be made on any fairly fertile land, but a sandy loam or clay loam enriched with manure is ideal. Light sand with plenty of manure will give good results. Heavy clay is not very desirable because it bakes or forms clods if worked when it is just a little too wet or too dry. A good dressing of manure, however, will improve soil of this kind wonderfully.



FIG. 2.—Not very promising, but a good vacant-lot beginning—garden truck taking the place of tin cans and rubbish. Courtesy Minnesota Club Work.

If vacant lots (fig. 2) and other lands long idle are used, they probably will be acid. Usually 1 pound of dry-slaked lime to 30 square feet of surface well worked into the ground after it is plowed will correct this. A liberal application of unleached wood ashes will be even better than lime for this purpose. Coal ashes will not correct the acid condition of the soil nor add fertility to it.

PREPARATION OF SOIL.

The ground should be plowed or spaded 8 to 15 inches deep when it is just dry enough to break up nicely. Then it should be cultivated, harrowed, rolled, or raked into fine tilth to form a good seed bed, particularly for the small seeds.

DISTANCE APART OF ROWS.

This will depend upon the kind of plants and the kind of cultivation. If a hand cultivator or wheel hoe (fig. 3) is used, the rows of small plants like radish, lettuce, beets, etc., may be only 15 inches apart. Potatoes, corn, etc., should be about 30 inches apart. If horse cultivation is used all of the rows should be 30 to 36 inches apart.

TIME OF PLANTING SEEDS.

Garden peas are hardy and should be planted very early; in fact, even while frosts occur nightly. Early potatoes and spring-planted spinach follow, and if heavy frost threatens after the potato tops are several inches high they may be covered with earth for protection. Lettuce,



FIG. 3.—A good type of hand cultivator or wheel hoe which has several attachments, as shovels, rake, cultivator teeth, and plow. Courtesy Indiana Club Work.

beets, radishes, turnips, carrots, onions, and parsnips may be planted early also. The other crops, like beans, cucumbers, melons, etc., should not be planted until the ground warms up and frosts have practically ceased; "apple-blossom time" is about right for these.

LAYING OFF STRAIGHT ROWS.

Set stakes the required distance apart across each end of the garden and stretch a stout string or garden line between two opposite stakes to mark the location of the row. Run a pointed hoe, or garden cultivator with pointed shovel, along the string to open up the row. The depth of row will vary with kind of seed. For plants grown in hills the places for seeds may be indicated by a light stroke with a hoe beneath the garden line. Straight rows add to the attractiveness of the garden (see fig. 4), and make it easier to cultivate.

SUCCESSION OF CROPS.

A succession of crops like radishes, beans, corn, etc., may be had over a large part of the entire season by making successive plantings of seeds every ten days or two weeks. Furthermore, two or more crops may be grown on the same ground by successive plantings. As soon as a portion of a row of one crop is removed seeds of the same or another crop should be planted at once. With sweet corn, for instance, as many as five or six different plantings may be growing at one time. Keep the ground busy, have something growing on the whole garden throughout the entire season.

OUTDOOR SEED BED.

Circular NR-2 of this series described the seed box for growing early plants indoors. The outdoor seed bed for later plants may be made in a cold frame or in very rich friable soil in any part of the garden. The seeds for late crops of tomatoes, cabbage, or other desired crops, are sown thickly in rows or broadcast. With good care the plants grow rapidly. The seed bed should be well soaked with water just before the plants are pulled for transplanting. As the



FIG. 4.—Straight rows add to the attractiveness of the garden. Courtesy Colorado Club Work.

plants are pulled the roots should be dipped in thin mud, which protects them from drying out while being handled. This is called “puddling the roots.” If loose rich soil is not available and heavy clay must be used, the plants should be taken up with a knife or trowel to retain the earth on the roots.

SOWING THE SEED AND SETTING THE PLANTS.

The seeds of most garden crops are sown in the garden where the plants are to grow and mature. With a few crops like the tomato and cabbage the seeds are sown in seed boxes indoors for the early crop (see Circular NR-2) and in outdoor seed beds for the late crop. The following brief directions are offered as a guide for general garden planting, the names of the vegetables being arranged alphabetically:

Asparagus.—Set two-year old plants 14 inches apart in rows 3 feet apart. Open up rows 8 to 10 inches deep and 6 to 8 inches wide at bottom, spread out roots, and cover crowns with about 2 inches of earth. As the shoots grow fill in earth until surface is level. Give good cultivation all season. Asparagus plants usually are purchased from seedsmen.

Bean, bush or snap.—Plant 4 or 5 seeds 1 to 2 inches deep in hills 12 to 15 inches apart and later thin to 2 or 3 plants when 4 to 6 inches high; or plant single seeds 3 inches apart in rows.

Bean, pole.—Plant 4 or 5 seeds 1 to 2 inches deep in hills 3 to 4 feet apart in the row. Thin to 2 or 3 plants when 4 to 6 inches high. A pole 5 to 6 feet long is necessary for each hill and

the poles should be set in position before the seeds are planted. If possible, have two rows of pole beans and slant the poles so that the tops of each set of four may be tied together "tent-like" for mutual support. (See fig. 5.)

Bean, bush lima.—Plant 3 or 4 seeds 1 inch deep, eyes downward, in hills 20 to 24 inches apart. Thin to 2 plants when 6 inches high.

Bean, pole lima.—Plant 3 or 4 seeds 1 inch deep, eyes downward, in hills 3 to 4 feet apart. Thin to 2 or 3 plants when 4 to 6 inches high. Set the poles exactly as directed for pole beans above.

Beet.—Sow seeds one-half inch deep, using one-half ounce for 25 feet of row. The surplus plants thinned out make good "greens."

Brussels sprouts.—Culture same as cabbage.

Cabbage.—Set plants 15 inches apart in the row. Plants for early crop are grown in seed box as described in Circular NR-2. Plants for late crop are grown in outdoor seed bed.

Cauliflower.—Culture same as cabbage, except that when heads form the leaves should be tied together above the head to keep out the light.



FIG. 5.—Note the tent-like arrangement of the bean poles. Courtesy Rhode Island Club Work.

Carrot.—Sow seeds one-half inch deep, using one-fourth ounce to 25 feet of row. Thin if necessary to prevent crowding.

Celeriac.—Culture same as celery.

Celery.—Sow seeds in seed box or seed bed early before warm weather comes, and in June or July transplant to the garden. Set plants 6 inches apart in the row.

Chard, Swiss.—Sow seeds one-half inch deep, using one-half ounce for 25 feet of row. Thin out surplus plants if necessary.

Citron.—Culture same as watermelon.

Corn, sweet.—Plant 5 or 6 seeds 1 inch deep in hills 2 to 3 feet apart. When 4 inches high thin to 2 plants per hill. Make successive plantings every two weeks.

Cucumbers.—Plant 8 or 10 seeds 1 inch deep in hills 4 feet apart and thin to 2 plants per hill or have single plants 1½ feet apart in rows 7 feet apart.

Dandelion.—In midsummer sow seeds one-half inch deep and thin plants to 12 inches apart. This crop can not be used until the following spring.

Eggplant.—Set plants from seed box or seed bed 2 feet apart in the row.

Endive.—In midsummer sow seeds one-half inch deep and later thin plants to 8 inches apart. Tie leaves to blanch the heart.

Kohl-rabi.—Sow seed one-half inch deep, using one-eighth ounce to 50 feet of row, and later thin the plants to 4 or 6 inches apart.

Leek.—Sow seed 1 inch deep, using one-eighth ounce to 25 feet of row. Thin plants to 4 inches apart and, when nearly grown, mound up the earth 6 to 8 inches high to blanch the fleshy stem.

Lettuce.—Sow the seeds one-half inch deep, and later thin the plants to 5 or 6 inches apart. Make successive plantings.

Mint.—One or two plants at one side of the garden will be sufficient. Secure a clump or two of roots from a neighbor or seedsman in the spring.

Muskmelon or cantaloup.—Plant 8 or 10 seeds an inch deep in hills 6 feet apart, and later thin to 2 or 3 plants per hill, or grow single plants 2 feet apart in the row.

Onion, sets.—Plant the sets 3 inches apart in the row.

Onion, seeds.—Sow seeds three-fourths inch deep, using one-fourth ounce to 25 feet of row. Thin plants later to 3 inches apart. Seeds may be planted in seed box or seed bed and transplanted 3 inches apart in garden row.

Onions, multiplier.—Plant bulbs or sets in the fall for producing green onions early the following spring.

Oyster plant.—This is salsify, which see.

Parsley.—Sow seeds one-half inch deep thinly in the row and later thin plants as necessary to prevent crowding.

Parsnip.—Sow seeds three-fourths inch deep and later thin plants to 3 inches apart. One-fourth ounce of seed will plant 50 feet of row.

Peas.—Make a trench 4 to 6 inches deep, sow 1 to 2 pints to each 100 feet of row, and cover 2 inches deep. As plants grow fill up trench with earth. Peas may be planted in double rows 1 foot apart if so desired. Brush or poultry wire should be used to support the vines. Successive plantings of peas should be made to cover a long season.

Peppers.—Plants from seed box or seed bed should be set 18 inches apart in the garden row.

Potatoes, early.—Make trench 6 inches deep and plant in hills 16 inches apart. Cover with 2 inches of earth and fill in as plants grow. If frost threatens, cover entire plants with earth. If tubers are of medium size or larger, cut to two-eye pieces.

Potatoes, late.—Same as early crop, but plant in July or August.

Potatoes, sweet.—Set plants 14 inches apart in the row; a warm, loose, sandy soil is best for this crop. Plants are obtained usually from seedsmen.

Pumpkin.—Plant 8 or 10 seeds in hills 8 to 10 feet apart, and thin later to 2 or 3 plants per hill.

Radish.—Sow seeds three-fourths inch deep, using one-fourth ounce for 25 feet of row. Make successive plantings.

Rhubarb.—Set plants or crowns 3 to 4 feet apart in the row. New plants or crowns are made by dividing up old plants or by sowing seeds three-fourths inch deep and thinning plants to 6 or 8 inches apart. Growing seedlings, however, is not recommended.

Ruta-baga.—During last half of June sow seeds three-fourths inch deep, using one-fourth ounce to 100 feet of row. Later thin plants to 6 or 8 inches apart.

Salsify.—Sow seeds one-half inch deep, using one-fourth ounce to 25 feet of row. Thin plants later to 3 inches apart.

Spinach, spring crop.—Sow seeds 1 inch deep, using one-fourth ounce to 25 feet of row.

Spinach, fall crop.—Sow seed 1 inch deep in August, using one-fourth ounce for 25 feet of row.

Squash, bush or summer.—Plant 8 or 10 seeds 1 inch deep in hills 4 to 5 feet apart, and later thin to 2 or 3 plants per hill.

Squash, Hubbard type.—Plant 8 or 10 seeds 1 inch deep in hills 8 to 10 feet apart, and later thin to 2 or 3 plants per hill.

Tomato.—Transplant from seed box or seed bed. Set plants 18 inches apart in row if they are to be supported by stakes, or 3 or 4 feet apart if not staked.

Turnip, early spring crop.—Sow seeds one-half inch deep, using one-fourth ounce to 50 feet of row.

Turnip, fall crop.—Sow seeds one-fourth inch deep, using one-fourth ounce to 50 feet of row in July or August.

Watermelon.—Plant 8 or 10 seeds 1 inch deep in hills 10 feet apart, and later thin to 2 plants per hill; or grow single plants 3 feet apart in rows 10 feet apart.

CULTIVATING THE GARDEN.

It is generally understood that the garden needs thorough cultivation to keep the ground in good fine condition, to retain moisture, to kill weeds, and to liberate plant food. Cultivation should be given at least every ten days when rains do not interfere. Since rains pack the ground it should be cultivated as soon as it is dry enough after each rain. Hoeing is considered a form of cultivation.

Rains may cause an earth crust to form over seeds before they can germinate; this crust should be broken up with a garden rake or other garden tool. Because many of the small seeds are slow to germinate and radish seeds germinate quickly, it is a good plan to scatter a few radish seeds in the rows with them to act as markers in outlining the row should early cultivation be desired.

BULLETINS ON VEGETABLE CULTURE.

Those who desire more information on growing garden crops than is contained in this circular should send to their State college of agriculture. The United States Department of Agriculture, Washington, D. C., has the following Farmers' Bulletins which may be helpful: 254, Cucumbers; 255, Home Vegetable Garden; 289, Beans; 324, Sweet Potatoes; 354, Onion Culture; 433, Cabbage; also Bureau of Plant Industry Document 883, Tomato Growing as Club Work in the North and West.

(Issued April 2, 1917)

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**HOME GARDENS.****INSECTS AND DISEASES OF VEGETABLES AND HOW TO COMBAT THEM.**

By C. P. CLOSE, *Horticulturist and Pomologist in Extension Service, Bureau of Plant Industry.*

INTRODUCTION.

Although all garden vegetables are likely to be attacked by diseases and insects, some of them will pass through the season without harm of any kind. It is not safe, however, to trust to luck or to risk losing a part or all of the crop by neglecting to take necessary precautions against disease and insect control. To a person with little or no experience in spraying, it seems like a formidable task to prepare and apply the different spray mixtures, but it is not such an intricate undertaking when one gets into the spirit of it. By following directions closely one ought to be able to prepare and apply the spray mixtures with marked success.

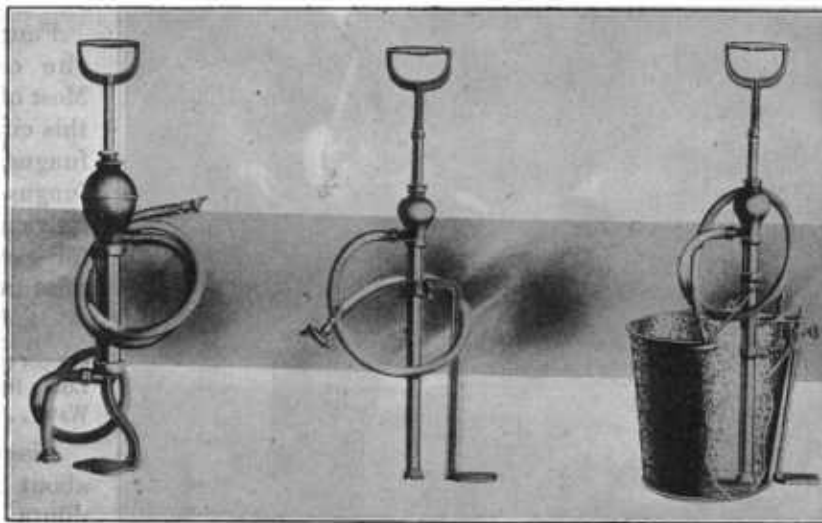


FIG. 1.—Bucket spray pump suitable for use in gardens. These pumps sell for about \$4 or \$4.50.

The instructions given in this circular must necessarily be very brief, and are particularly for those who have small gardens and need small quantities of spray mixtures. Those who desire fuller information on particular diseases or insects may secure such information from their State agricultural college or from the United States Department of Agriculture, Washington, D. C.

SPRAY PUMPS.

For garden use the bucket pumps (see fig. 1), the small compressed-air sprayer (see fig. 2), and the hand sprayer or small atomizer sprayer (see fig. 3) are best. The last one mentioned is very cheap and will be entirely satisfactory for the small garden.

Small spray pumps may usually be purchased at the local seed and hardware store, or from seedsmen in the cities.

If a spray pump is not available, the spray mixture may be roughly applied with a sprinkling pot, which is very wasteful, or it may be "spattered" on the plants with a whisk broom. The whisk broom was used for this purpose before spray pumps were invented.

SIFTERS OR SHAKERS.

Powdered arsenate of lead or Paris green mixed with air-slaked lime, road dust, or sifted ashes may be dusted or sifted on the plants by means of a cheap flour sifter or other similar sifter. A tin can with small holes punched in the bottom makes a very serviceable sifter for this purpose. Sulphur may be applied with a sifter. If plants are wet with dew the dusting material sticks to them very well.

FUNGICIDES, OR TREATMENT OF PLANT DISEASES.

Fungicides are preparations for the control of plant diseases. Most of the diseases mentioned in this circular are caused by some fungus, so the diseases are called fungus diseases and the remedies fungicides. The best fungicide for garden diseases is Bordeaux mixture, which is made as follows:

BORDEAUX.

Copper sulphate or blue stone.	ounces..	6
Lump lime.	do....	6
Water.	gallons..	5

Dissolve the copper sulphate in about 2 quarts of hot water and dilute this with cold water to make 2½ gallons. Use a wooden or earthen vessel for this purpose. Slake the lime and dilute with water to make 2½ gallons. Pour the copper sulphate solution slowly into the lime water while stirring vigorously with a paddle. This is Bordeaux. *Be sure to use fresh lump lime.*



FIG. 2.—Spraying a rosebush with compressed-air sprayer. This is one of the best types of small sprayers for garden use. Prices range from \$5 to \$8.50, depending upon whether the tank is made of galvanized iron or brass.

Bordeaux is not of itself a remedy to be used against insects except as it repels flea beetles from the potato, eggplant, and other plants. If, however, arsenate of lead or Paris green is added to Bordeaux one of the best combination sprays for both chewing insects and diseases is the result. Bordeaux and nicotine sulphate make a splendid combination spray for plant diseases and sucking insects.

Strain the Bordeaux, so that it does not clog the nozzle while being sprayed.

It is a good plan to slake a few pounds of lime and keep it for use as needed. If kept covered with a little water it will keep for months and may be used in any of the mixtures requiring lime.

Concentrated Bordeaux is sold in sealed packages in small or large quantities by seedsmen and perhaps by most local dealers who handle spray pumps. Trade names have been given to some of the Bordeaux preparations, and some of these contain poison for combating leaf-eating insects.

SULPHUR.

Pulverized sulphur or flowers of sulphur is used to control mildew by dusting it full strength on the diseased plants.

INSECTS.

One particular point to remember about insects is that there are two classes, one that *sucks* its food and one that *chews* and *swallows* its food. Among the first class which suck the sap of plants are the true bugs and plant lice or aphids, as the squash bug and "melon louse." These insert their beaks into the plant tissue and suck the sap just as a mosquito inserts its beak and sucks blood from a person or animal. These can not be poisoned, so must be killed by a spray mixture coming in contact with their bodies.

The other class—potato beetle, cabbage worms, cut-worms, and others—eats the leaves of plants, and either the mature insect or the "worm," larva, may do this eating. These are killed by eating the poison sprayed or dusted on the plants or mixed into poisoned bait.

INSECTICIDES, OR TREATMENTS FOR INSECTS.

Insecticides are preparations for the control of insects. These are of two classes—contact mixtures for sucking insects and poison mixtures for chewing insects.

Contact Insecticide.

NICOTINE SULPHATE.

Nicotine sulphate (40 per cent).....	ounce..	1
Laundry or other soap.....	do....	1
Water.....	gallons..	4

Dissolve the soap and add it and the 40 per cent nicotine sulphate solution to the water. This is one of the simplest and most effective contact sprays.

A stock of dissolved soap may be kept on hand in a glass jar ready for instant use. It does not matter if an excess of soap is used.

Remember this is only for *sucking* insects. Spray as early as possible and as often as necessary to control them. The aphids or plant lice usually collect on the underside of leaves, and their injury to the leaves causes them to crumple, with the edges turned down, thus protecting the aphids. It is difficult to reach aphids with the spray when the leaves are much crumpled. Leaves badly attacked with aphids in this way should be picked and burned.

This remedy will kill the aphids on other plants like rosebushes, ornamental shrubs, and fruit trees.

If 4 gallons of Bordeaux instead of water are used with nicotine sulphate and soap, both sucking insects and plant diseases may be combated with this combination spray.

Nicotine sulphate is sold by most seedsmen.

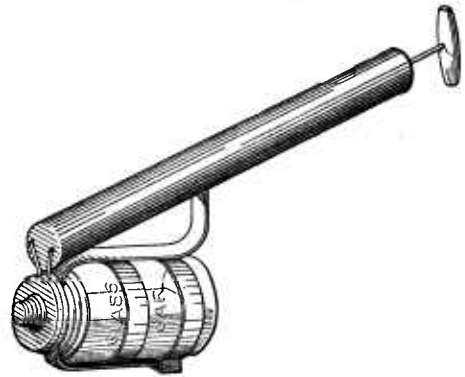


Fig. 3.—Hand sprayer or small atomizer sprayer. This one with glass receptacle for holding spray mixture is better than those with metal receptacle. These are sold at from 50 cents to about \$2.

Poison Insecticides.**ARSENATE OF LEAD.**

Arsenate of lead (powder).....	ounces..	2
Water.....	gallons..	3
Or		
Arsenate of lead (paste).....	ounces..	4
Water.....	gallons..	3

Arsenate of lead is one of the best poisons to use because it mixes evenly in water or Bordeaux and sticks well to the foliage. The powder form is more convenient to handle and weigh than is the paste. It should be kept well stirred while being sprayed so as to spread the poison evenly over the plants.

If both insects and diseases are to be controlled, Bordeaux should be used instead of water, thus making one of the best combination sprays for both plant diseases and chewing insects. One spraying will then take the place of two simple sprayings.

Arsenate of lead should not be used on cabbage or cauliflower after the heads begin to form.

ARSENATE OF LEAD (APPLIED DRY).

Arsenate of lead (powdered).....	ounce..	1
Air-slaked lime, dry road dust, or sifted ashes.....	pounds..	3

These are mixed together and dusted onto the plants with any kind of a sifter. This should be done in the morning while the plants are wet with dew. Arsenate of lead is preferred to Paris green for this purpose.

PARIS GREEN.

Paris green.....	ounce..	1
Lime (lump).....	ounces..	2 to 4
Water.....	gallons..	10

For potatoes use only 6 gallons of water instead of 10.

When Paris green is used in water, lime must be added to prevent injury to the foliage. The lime should be slaked in the ordinary way; air-slaked lime will not do.

If Bordeaux instead of water is used, this lime is not necessary. Paris green is heavy and settles quickly if the mixture is not stirred while being sprayed. Bordeaux and Paris green together make a good combination spray for plant diseases and chewing insects. Paris green should not be used on cabbage or cauliflower after the heads begin to form.

PARIS GREEN (APPLIED DRY).

Paris green.....	ounce..	1
Air-slaked lime, dry road dust, or sifted ashes.....	pounds..	3

Paris green in lime, road dust, or ashes is often used dry by being sifted on potatoes and other plants to kill chewing insects.

The high price of Paris green at present prohibits its use, but since arsenate of lead is replacing it and is better in every respect, no hardship to the gardening public will follow the temporary passing of Paris green.

PYRETHRUM OR INSECT POWDER.

Pyrethrum.....	ounce..	1
Water.....	gallons..	2

One ounce of pyrethrum in two gallons of water is the best spray for vegetables like cabbage, cauliflower, etc., after heads have begun to form, because it is not poisonous to people like arsenic is.

Pyrethrum may also be used full strength as a dry powder, being dusted on the plants with a bellows or powder shaker.

Combination Sprays for Plant Diseases and Chewing Insects.

BORDEAUX-ARSENATE OF LEAD.

Bordeaux.....	gallons..	3
Arsenate of lead (powder).....	ounces..	2

Or

Bordeaux.....	gallons..	3
Arsenate of lead (paste).....	ounces..	4

BORDEAUX-PARIS GREEN.

Bordeaux.....	gallons..	10
Paris green.....	ounce..	1

For potatoes use 6 gallons of Bordeaux instead of 10.

The advantage of these combination sprays is that both plant diseases and chewing insects may be sprayed for at one time, thus reducing the labor of spraying one-half. They should always be used if possible.

For spraying cabbage and cauliflower before the heads form, resin Bordeaux instead of Bordeaux should be used with arsenate of lead or Paris green.

Combination Spray for Plant Diseases and Sucking Insects.

BORDEAUX-NICOTINE SULPHATE.

Bordeaux.....	gallons..	4
Nicotine sulphate.....	ounce..	1
Laundry or other soap.....	do....	1

This combination spray is for plant diseases and sucking insects, especially aphids. It should be used whenever disease and aphids are both present on plants.

POISONED BAIT.

Wheat bran.....	pounds..	2
White arsenic (powdered).....	ounce..	1
Cheap sirup.....	ounces..	2 or 3
One lemon or orange chopped fine.		
Water—enough to make thick mash.		

Mix bran and white arsenic together and dilute the sirup with a little water.

Pour diluted sirup over the bran and white arsenic, add the lemon or orange, stir well and add enough water to make a thick mash. Place very small portions of the bait around plants subject to attack by cutworms or slugs. Also place bait beneath chips or small pieces of boards under which the cutworms and slugs collect and may eat it during the day.

SLUGS.

Slugs are worm-like creatures which often eat young lettuce and many other plants. They are particularly fond of ripe tomatoes and other vegetables, strawberries, and some other fruits. The poisoned bait just mentioned is the remedy for them. They feed at night and hide under cover of some kind during the day. The bait should be placed wherever they happen to become injurious.

HOW TO USE THESE INSTRUCTIONS.

The reader should consult the spray calendar which follows and gives the names of vegetables arranged alphabetically, the diseases and insects attacking them, and the kind of spray to use for each, and the time different sprayings should be applied. After deciding which spray is to be used he should refer to the discussion of that particular spray to find out how it should be prepared, and use it exactly as stated.

SPRAY CALENDAR FOR GARDEN DISEASES AND INSECTS.

Plant.	Disease or insect.	Spray to use.	First spraying.	Second spraying.	Third spraying.	Remarks.
Asparagus.....	Rust. (Rusty appearance of leaves and stems.) Beetles. (Eat the young stems and leaves.)	Arsenate of lead.....	When beetles appear on young plants. On old plants after the cutting season.	10 days later.....	10 days later if necessary.	Secure a rust-resistant variety, such as Reading Giant, or Palmetto. Arsenate of lead must not be used on the new stems during the cutting season.
Bean (bush).....	Anthracnose. (Dark, sunken, scab like spots on pods and spots on leaves.) Bacterial blight. (Water-soaked spots on leaves and pods.) Aphids or plant lice. (Suck sap from all parts of the plant and cause leaves to crumple.) Leaf-beetles. (Beetles are very small, dark, or pale striped and eat the leaves.)	Pick and burn diseased pods. No satisfactory remedy. Nicotine sulphate..... Arsenate of lead.....	 When aphids first appear. When beetles appear..	 Repeat when necessary. Repeat 10 days later..	 Repeat when necessary. Repeat if necessary....	This disease is carried on the seed, so seed from healthy plants only should be saved. All diseased plants should be burned. Do not cultivate when plants are wet. Pick and burn crumpled leaves which protect the lice from the spray. Bordeaux repels these beetles to some extent but does not kill them.
Beets.....	Leaf spot. (Spots reddish and purple then turn ashy gray.) Web worm. (Eats the leaves.)... Beet flea beetles. (Small beetles eat the leaves.) Spinach aphids. (Sucks sap from the leaves.) Beet-root aphids. (Sucks sap from the roots.)	Bordeaux..... Arsenate of lead..... .....do..... Nicotine sulphate..... .....do.....	When plants are 3 to 4 inches high. When worms appear.. When beetles appear.. When aphids appear..	Two weeks later..... Repeat when necessary. .....do..... .....do..... Repeat if necessary....	Two weeks later..... 	Usually garden beets do not need spraying. The spray must be directed against the undersides of the leaves to strike the aphids there.
Brussels sprouts.	Same as cabbage, which see.....					
Cabbage.....	Club root. (Root swells and decays.) Black rot. (Leaves turn yellow, then brown, then black, and decay.) Yellows. (Leaves turn yellow, then brown, and finally drop.) Black leg. (Diseased sunken areas on stem, leaf stem, midrib, and margin of leaves, plant takes on purplish tint.) Cabbage maggot. (Tunnels inside the roots.)	Pull up and burn plants. .....do..... Pull up and burn plants. Pull up and burn diseased plants. Tarred paper disk, as described under "Remarks."	 On seed bed sprinkle 2 quarts of Bordeaux on each 5 square feet as soon as seed is planted.	 Repeat in two weeks..	 Repeat just before plants are taken out of seed bed.	In the spring apply 1 pound of lime to each 8 square feet of ground before plants are set out. This is a bacterial disease not controlled by spraying the plants. The seed should be soaked for 15 minutes in formalin, 4 ounce to 3 pints of water, or in corrosive sublimate, 15 grains to 1 quart of water, then rinse seed in clean water and either plant or dry it. The remarks above apply to yellows also. As soon as the plants are set, take a piece of tarred building paper 2 or 3 inches in diameter, cut a slit from one side to center, cut 4 or 5 very short slits at center, slip plant through long slit, fit short centers slits, around stem of plant, and press paper firmly against

	Cabbage worms. (Eat the leaves.)	Arsenate of lead.....	When worms appear..	Repeat if necessary, if heads have not formed.	.....	the ground; this will prevent young maggots from reaching the root of plant.
		Pyrethrum.....	do	Repeat if necessary....	Repeat if necessary....	Do not use Paris green or arsenate of lead after heads form. A little soap in the water will make these poisons stick better.
	Aphids or lice. (Suck sap from leaves.)	Nicotine sulphate....	When aphids appear..	do .....	.....	Pyrethrum may be used after the heads form.
	Cutworms. (Dark-colored worms, eat plants off at surface of ground.)	Poison bran mash or clover dipped in Paris green and water.	Spread poisoned mash or clover over ground before cabbage plants are set out and around plants as soon as set.	Spread poisoned bait around plants as necessary to control worms.	.....	Cutworms are abundant in sod, and crops on freshly plowed sod are likely to be badly injured. Wrap paper around stem from root to leaves just before plants are set.
	Cabbage looper. (Eats the leaves.)	Same as for cabbage worms.	.....	.....	.....	.....
Cauliflower.....	Same as cabbage, which see.....	.....	.....	.....	.....	Do not use Paris green or arsenate of lead after the heads begin to form.
Carrot.....	.....	.....	.....	.....	.....	Will probably not need treatment.
Celery.....	Same as celery, which see.....	.....	.....	.....	.....	.....
Celery.....	Blight or leaf spot. (Gray or brown spots, stems droop.)	Bordeaux on young seedlings in seed box or seed bed.	As soon as set in garden.	10 to 14 days later	10 to 14 days later	The seed bed sparring is very important to prevent the disease from becoming serious.
	Damping off. (Little seedlings die in seed bed.)	.....	.....	.....	.....	Young celery seedlings should be carefully watered and partially shaded in hot, dry weather.
Chard.....	Leaf spot.....	Usually no spraying is necessary.	.....	.....	.....	If disease appears, spray as directed for beets.
Corn.....	Smut. (Large, black, irregular swellings on ears or tops.)	No satisfactory remedy.	.....	.....	.....	Cut off and burn smut swellings.
	Cutworms. (Dark worms which cut small corn plants off at surface of ground.)	Poisoned bait as mentioned under cabbage.	Repeat if necessary....	.....	.....	Cutworms work mostly at night. In the morning they may usually be found in the ground by a cut-off plant. Dig them out and kill them. They are worst on land recently in sod.
	Corn ear worm. (Bores through husk and eats young kernels.)	No satisfactory remedy	.....	.....	.....	Kill all worms found when corn is husked for use.
Cucumber.....	Anthraxnose. (Brown spots on leaves.)	Bordeaux.....	When plants begin to form vines.	2 weeks later.....	2 weeks later.....	Repeat if necessary.
	Downy mildew. (Yellow spots on leaves.)	do	do	do	do	Do.
	Wilt. (Leaves droop and wilt in a short time.)	Pull up and burn plants.	.....	.....	.....	Control striped beetles, which spread the disease.
	Striped beetle and 12-spotted beetle. (These eat the leaves.)	Arsenate of lead in the Bordeaux used for diseases; or tobacco dust; or cover plants with cloth or wire gauze protectors.	Soon as beetles appear, or when covers are removed.	5 days later.....	5 days later.....	Repeat as often as necessary
	Vine borer. (Worm bores in vine at surface of ground.)	Cut vine lengthwise and remove and kill borer.	.....	.....	.....	Throw earth over vines every few feet so that new roots will form at these places.

Spray calendar for garden diseases and insects—Continued.

Plant.	Disease or insect.	Spray to use.	First spraying.	Second spraying.	Third spraying.	Remarks.
Cucumber	Stink bug or squash bug. (Sucks sap from leaves and injects poisonous substance into leaves.)					Pick the bugs or shake them into a pan containing a little kerosene. Also destroy egg masses. Bugs will collect under small pieces of boards placed near the hills and are then easily crushed.
Eggplant.....	Blight or wilt. (Whole plant wilts.) Anthracnose. (Dark sunken spots in fruit, cracks in leaves.) Flea beetle. (Small jumping beetle which eats leaves.)	Pull up and burn plants. Bordeaux..... Bordeaux will repel beetles.	When plants are set	10 days later	10 days later	This is a difficult disease to control.
Endive						Not likely to be injured by pests.
Kohl-rabi.....						Not likely to be injured by pests.
Lettuce.....						Garden lettuce is seldom injured by diseases or insects, but slugs may attack it.
Muskmelon.....	Anthracnose. (Dark spots on leaves; long light brown spots on stems; deep round spots on melons.) Leaf blight. (Small dark spots on leaves.) Striped cucumber beetle..... Spotted cucumber beetle..... Flea beetle. (Eats the leaves.) Spanish vine borer. (Worm bores into vine at surface of ground.) Aphids or lice. (Suck sap from leaves.)	Bordeaux..... do..... Same treatment as for cucumbers. do..... Nicotine sulphate.....	When plants begin to form vines. do..... do..... do.....	Two weeks later..... do..... See cucumbers..... do..... Repeat if necessary....	Two weeks later..... do..... See cucumbers..... do..... Repeat if necessary....	Repeat if necessary. Do. Plants badly infested with leaves crumpled should be pulled up and burned.
Onion.....	Thrips. (Small sucking insects).. Cutworms. (Dark worms which cut off plant just above ground.)	Nicotine sulphate..... Same treatment as for cutworm of corn.	When thrips appear...	Repeat if necessary....	Repeat if necessary....	Thrips cause the onion leaves to become silvery or whitened and later curled and twisted.
Parsley.....						Not likely to be injured by pests.
Parsnip.....						Not likely to be injured by pests.
Peas.....	Powdery mildew. (Covers entire plant with a powdery white growth.)	Pulverized sulphur or flowers of sulphur, or Bordeaux.	Sprinkle on plants when mildew appears. Just before bloom appears.	Repeat if necessary.... Two weeks later.....	Repeat if necessary.... do.....	Usually the garden crop does not need treatment for diseases.

	Pea aphid.....	Same as for bean aphids, which see.				Aphids are usually not troublesome in the garden.
Pepper.....						Not likely to be injured by pests.
Potato.....	Early blight. (Brown spots with concentric rings on leaves.) Late blight. (Spots on leaves are dark brown and look water-soaked; they do not have concentric rings. Spots become yellow and leaves die.) Colorado potato beetle. (This is the common "potato bug" which eats the leaves.) Billster beetle or long black potato bug, or old-fashioned potato bug. (Eats leaves.) Flea beetle. (Small jumping insect which eats the leaves.)	Bordeaux..... do..... Arsenate of lead..... Same remedy as for Colorado potato beetle above. Same remedy as for Colorado potato beetle above. Spray as repellant.	When plants are 6 inches high. do..... When beetles appear..	2 weeks later..... do..... Repeat when necessary	2 weeks later..... do..... Repeat when necessary	This disease comes early in the season and is worst in moist weather. This disease is worst in hot sultry weather in August and September. Disease from the plants lives over winter on seed potatoes. The beetles are often hand picked or jarred into a vessel containing water with a little kerosene. Flea beetles usually appear early when potato plants are small.
Pumpkin.....	Diseases, insects, and remedies same as cucumber, which see.					
Radish.....	Cabbage maggot. (Small worms which tunnel into the radish.)	Tobacco dust sprinkled along row when seed is planted, or sand sprinkled with kerosene scattered along the row when plants are small will repel the maggot.				Burn all plants infested with maggots.
Rhubarb.....	Flea beetle. (Eats small holes in the leaves.)	The same remedy for flea beetle of potato, which see.	When beetles appear..	Repeat if necessary....		
Rutabaga.....						May be attacked by the same pests as cabbage, and treatment is the same as given under cabbage, which see.
Salsify.....						Not likely to be injured by pests.
Spinach.....	Aphids. (Suck sap from leaves.)	Nicotine sulphate.....	When aphids appear. Spray underside of leaves.	Repeat if necessary....	Repeat if necessary....	
Squash.....	Insects, diseases, and remedies same as cucumber, which see.					
Tomato.....	Leaf spot or blight. (Leaves become spotted, turn yellow and drop; stems dry up and fruits drop.) Fruit rot. (Decay begins at blossom end of fruit.)	Bordeaux. Spraying not entirely effective. No effective remedy...	While plants are small in seed box or seed bed.	Soon after transplanting to garden.	3 weeks later.....	If disease is present spray every 3 weeks. Cultivate well, and water according to the needs of the plants. The variety Bonny Best is usually free from this disease.

Spray calendar for garden diseases and insects—Continued.

Plant.	Disease or insect.	Spray to use.	First spraying.	Second spraying.	Third spraying.	Remarks.
Tomato.....	<p>Anthracnose. (Causes sunken discolored spots in fruit, which then decays.)</p> <p>Wilt. (Plants wilt and die).....</p> <p>Tomato worms. (Large green, naked caterpillars which eat the leaves.)</p> <p>Cutworms. (Dark worms which cut plants off at the surface of the ground.)</p> <p>Flea beetle. (Small jumping beetle which eats small holes in leaves.)</p>	<p>Same treatment as for leaf spot.</p> <p>Pull up and burn plants.</p> <p>Hand pick and kill the worms.</p> <p>Same treatment as mentioned under cabbage.</p> <p>Same treatment as mentioned under potatoes.</p>	.....	.....	.....	These seldom appear in large numbers.
			
			
			
			
Turnip.....	<p>Liable to have same diseases as cabbage, which see.</p>	<p>Same as for cabbage, which see.</p>	.....	.....	.....
Watermelon....	<p>Anthracnose. (Brown spots on leaves, small sunken spots on fruit.)</p> <p>Insects same as cucumber and muskmelon, which see.</p>	<p>Bordeaux.....</p>	<p>When melons are half grown.</p>	<p>10 days later.....</p>	<p>Repeat if necessary....</p>	

COOPERATIVE WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

SUGGESTIONS TO LOCAL LEADERS IN POULTRY-CLUB WORK.

By GEORGE E. FARRELL, *Assistant in Boys' and Girls' Club Work.*

If you are contemplating the organization of a boys' and girls' poultry club in your community, write to the State leader in charge of the club work at the agricultural college, asking for complete directions and cooperation in the work. The State leader, an experienced leader of boys and girls, will be able to assist you to succeed in this work. The State college of agriculture will supply the printed follow-up instructions, the standard requirement for poultry club work in the State, enrollment forms, report blanks, and possibly record books. Communicate also with the county club leader or county agents as well as county superintendent of schools and make inquiry regarding the organization of clubs in your county.

When you have learned the plans of the State and county club leader, the county agents, and the county superintendent of schools, you will then be ready to take up the work in your community.

PRESENTING CLUB WORK TO THE COMMUNITY.

Get a small group of interested citizens together and discuss with them the plans for club work. Secure the services of the State or county club leader to explain the value of this work at a general meeting of citizens, including teachers. The services of the State club leader should be arranged for at least one month in advance of the date for the meeting. At the close of the meeting request the parents and children interested in the poultry-club work to assemble at the front of the room to discuss plans for organization of a poultry club and securing a local leader for the club group. Get the names and addresses of boys and girls who desire to enter the club. Make a record also of interested adults.

PRELIMINARY MEETING.

Call a meeting of the boys and girls who desire to join the poultry club and go over with them in detail the requirements for membership. Give every prospective member an opportunity to talk and tell what he has now or may have available for the home project work. Have each member list things required before he may become a member, and require that these be secured before November 1.

ORGANIZATION MEETING.

About November 1 call the members together and go over with them the requirements for membership, accepting as members the applicants who have enrolled, signed agreement cards, and otherwise met the organization requirements.

Eleet officers and place as much responsibility upon them as possible. The prime object of boys' and girls' club work is to develop local leadership and responsibility through wise direction and encouragement of the boys and girls. Forward a list of officers and members to the State leaders immediately upon organization of the club. State club leaders may furnish a "charter" to each club.

FOLLOW-UP INSTRUCTIONS, PRINTED FORMS AND REPORTS.

The State leader will send by mail to the club members and local leader the necessary follow-up instruction, printed forms, and report blanks. These blanks will be accompanied by adequate instructions for use. The secretary of the club should be the custodian of permanent records and should inspect all reports made to the State or district leaders.

The follow-up instructions will be seasonal, bringing to the club member the information that he will need at once. Too much literature destroys the interest of the member and takes the "edge" off the work for the rest of the year and the efficiency away from the system of follow-up instructions. One piece of follow-up literature carefully studied and put into practice is much better than information from several sources that is conflicting and confusing. Do not confuse children with literature from several subject-matter specialists, instructors, and instructions that do not agree on the details of doing poultry work.

SERVICES OF POULTRY HUSBANDRY SPECIALIST.

The State club leader is in a sense a specialist in extension methods and in the organization of boys and girls into clubs to carry on project work. He has the services of subject-matter specialists who are trained in the poultry work. The poultry specialist whose services are available will meet with your club and go over the poultry project with the members. The specialist devotes all his time to instruction and direction of leaders and members in their poultry business. He should not be called upon to take up problems in organization or to deal with methods of general extension work. The specialist may also help the local club leader to become expert in poultry management.

REQUIREMENTS FOR A COMPLETED POULTRY PROJECT.

1. Local club must be organized before November 1.
2. A local leader is required for the group of members.
3. Each member must have at least six hens and a male bird.
4. Each member must have adequate housing facilities for poultry.
5. Each member must keep an egg record, also all records of costs of feed and receipts from sales.
6. Each member must be personally responsible for the hatching of at least 50 chicks before May 15.
7. Each member must make an exhibit of fowls, eggs, and record book or report.
8. Each member must attend all meetings of the club.
9. Each member must attend all field meetings held by the club.
10. Each member must prepare a written report and story of his work.

EMBLEMS—UNIFORMS.

The four-leaf clover with the 4 H's upon the leaves has come to be the recognized trademark of boys' and girls' club work. It has created a large and growing fraternity of achievement known and recognized throughout the United States.

For demonstration work each club member should have a suitable club uniform displaying the club emblem.

MEETINGS.

The following program is suggestive and will serve as a guide for monthly meetings and demonstrations. No meeting should be more than one and one-half hours long. If meetings are held in the evening they should begin at an early hour and the adjournment should be prompt. Bulletins similar to those mentioned are usually available at the State colleges of agriculture.

NOVEMBER MEETING.

1. (Twenty minutes.) Organization of club. Election of officers.
Local leader instructs officers in duties.
Report from club members to find if requirements are met and that each member has—
 - (a) Male bird and six hens.
 - (b) Standard bred or not.
 - (c) Adequate housing facilities.
2. (Forty minutes.) Explanation of club requirements by local club leader:
 - (a) Meetings.
 - (b) Records.
 - (c) Demonstrations.
 - (d) Hatching.
 - (e) Exhibits.
 - (f) Reports.
3. (Thirty minutes.) Club members discuss use of follow-up instructions on housing and feeding.
Discussion, purpose of leg bands and trap nests. Supplement with Farmers' Bulletin 682, "A Simple Trap Nest for Poultry."
Distribution of December follow-up instructions, "Selection and care of breeding stock."

DECEMBER MEETING.

1. (Twenty minutes.) Roll call.
Reports of members to secretary: Feed, egg production, arrangement of poultry house, scratch litter.
Discussion, "Feeding for egg production." Supplement with United States Department Circular 17, "Winter Egg Production."
Exhibition of record books and discussion of entries.
2. (Forty minutes.) Discussion on "Standard of Perfection¹ as applied to birds owned by club members."
Contest in naming parts of birds based on terms used in "Standard of Perfection."
Talk by poultry club members, "How to set a hen."
3. (Thirty minutes.) Discussion, "Early hatched chicks make early layers."
Debate, "Resolved, that it is more profitable to raise pure-bred fowls than mongrels."
Distribution of January follow-up instructions, "How to set a hen and care for her."

JANUARY MEETING.

1. (Twenty minutes.) Roll call.
Report of members to secretary.
Exhibition of record books and discussion of entries.
2. (Forty minutes.) Packing eggs for market. Supplement with Farmers' Bulletin 594, "Shipping Eggs by Parcel Post."
Feed and care of chicks. Supplement with Farmers' Bulletin 642, "Artificial and Natural Brooding of Chickens."
Feeding capons before sending to market. Supplement with Farmers' Bulletin 452 "Capon and Caponizing."
Relative merits of hen and incubator for hatching. Supplement with Farmers' Bulletin 585, "Artificial and Natural Incubation of Hens' Eggs."
3. (Thirty minutes.) Talk by member. Feed and care of breeding pens.
Distribution of February follow-up instructions, "Feeding and caring for chicks."

FEBRUARY MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibition of record books. Discussion.
2. (Forty minutes.) Talk by club members having largest egg yield during month.
3. (Thirty minutes.) Poultry play contests.
Continued discussion of feed and care of chicks.
Distribution of March follow-up instructions, "How to build a brood coop."

MARCH MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibition of record books and discussion of entries.

¹ The American Standard of Perfection is published by the American Poultry Association, Mrs. S. T. Campbell, secretary, Mansfield, Ohio.

2. (Forty minutes.) Diseases of chicks. Prevention and treatment.
Supplement with Farmers' Bulletin 530, "Important Poultry Diseases."
Discussion, "Feeding chicks for early maturity."
3. (Thirty minutes.) Demonstration of building a brooding coop.
Distribution of April follow-up instructions, "Lice and mites," "Produce infertile eggs," "Preserving eggs."

APRIL MEETING (AFTERNOON).

1. (Forty minutes.) Roll call.
Members' report to secretary.
Exhibition of record books. Discussion.
Discussion, "Treatment of lice and mites." Supplement with Farmers' Bulletin 801, "Mites and Lice on Poultry."
2. Field demonstration tour (afternoon) to club members' poultry yards, observing:
 - (a) Cleanliness of house and premises as a preventative of insect pests and disease.
 - (b) Condition of birds.
 - (c) Record of member.
 - (d) Method of feeding.
 - (e) Method of hatching and brooding.
3. Camp supper—egg feast and contest. (Plan to have members at home not later than 7 p. m.)
Distribution of May follow-up instructions, "Care of growing chicks during warm weather."

MAY MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibition of record books and discussion of entries.
2. (Forty minutes.) Reading written reports of field demonstration tour by club members.
Recommendation by club members and leader.
Production of infertile eggs. Supplement with United States Department of Agriculture "Egg Placard."
Study of prices of eggs for year to determine time for packing in water glass.
Selling broilers and friers.
3. Play contests, guessing games.
Distribution of June follow-up instructions, "Marketing old stock and broilers."

JUNE MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibition of record books. Discussion.
2. (Forty minutes.) Practice for public demonstration. Preserving eggs in water glass.
3. (Thirty minutes.) Exhibition display of feathers arranged by members.

June meeting.—Public demonstration (afternoon).

1. (Twenty minutes.) Business meeting.
2. (Forty minutes.) Demonstrations in—
 - (a) Setting a hen.
 - (b) Packing eggs for market—parcel post.
 - (c) Killing and dry picking.
 - (d) Selection of a good laying hen.
 - (e) Mixing grain feed.
 - (f) Mixing dry mash.
 - (g) Preparing green feed.
 - (h) Canning cockerels.
 (Be sure that members clean up after demonstration.)
3. (Thirty minutes.) Informal discussion and questions.
Distribution of July follow-up instructions, "Caponizing."

JULY MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibit of record books and discussion of entries.
2. (Forty minutes.) Demonstration. Caponizing. Supplement with Farmers' Bulletin 452, "Caponizing."
3. (Thirty minutes.) Social program. Refreshments.
Distribution of August follow-up instructions, "Preparing birds for the show."

AUGUST MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibit of record books. Discussion.
2. (Forty minutes.) Selection of stock from which a fowl is to be exhibited. Have judging contest by members.
3. (Thirty minutes.) Discussion: "Culling out late maturing fowls and poor layers. How to fatten them for market."
Social program.
Distribution of September follow-up instructions, "Common poultry diseases."

SEPTEMBER MEETING.

1. (Twenty minutes.) Roll call.
Members' report to secretary.
Exhibit of record books. Discussion.
2. (Forty minutes.) Making plans for the exhibit. (If possible cooperate with local poultry association.)
Discussion of Standard of Perfection as applied to fowls owned and to be exhibited by club members.
Selection of a bird for the exhibit, disqualification, defects, etc. A good exhibit consists of the following:
 - (a) The birds.
 - (b) Demonstrations by team members.
 - (c) Judging contests by team of members.
 - (d) Demonstration contest in caponizing, killing and dry picking, packing eggs, etc., by members.
3. (Thirty minutes.) Discussion by members: Roup, chicken pox—prevention and treatment.
Distribution of October follow-up instructions, "Feeding and housing winter layers."

OCTOBER MEETING.

1. (Twenty minutes.) Roll call.
Report of members to secretary.
Discussion and partial completion of report of club to State and county leader.
Demonstration of killing and dry picking.
Preparing fowls for winter quarters. Housing. Supplement with Farmers' Bulletin 574, "Poultry House Construction."
3. (Thirty minutes.) Social program. Poultry games, contests, etc.
Distribution of November follow-up instructions "Trap-nesting the layers."

NOVEMBER MEETING.**Achievement Day.**

1. Address—Youth Achievement is our Education. By a business man who can talk achievement.
2. Address—How Improve the Poultry Business. By a practical poultryman.
3. Address—What a Parent thinks of the Club Work. By a parent of a club member.
4. Report of club members on achievements of the year. Select at least four members.
5. Awarding of achievement medals. By local club leader, county superintendent of schools, county agent, or State leader of clubs.
Distribution of December follow-up instructions, "Selection and care of breeding stock."

It is understood that the poultry-club members will be given a chance to drill in parliamentary practice and the proper method of conducting a business session in their club meetings. A few moments' time devoted to this at the beginning of each session will be found very beneficial.

The third division of the program at the regular club meetings can be devoted entirely to social intercourse, if advisable, with a view to the development of the social and the cooperative strength of the club membership. In connection with these 30-minute periods, guessing games, poultry play contests, poultry stories, and other forms of entertainment may be provided.

This type of program will draw upon the resourcefulness and originality of the local leader as well as members. Its success will depend upon ability to organize successfully the play contests and dispatch the program quickly with a view to keeping everybody entertained and interested. Consult with the poultry specialists and poultry subject-matter departments of your State college of agriculture with a view to giving the kind of a program that will be seasonable and furnish to the club membership the kind of instruction they will need in connection with their home project.

SUMMARY.

1. Get in touch with and secure the cooperation of the State club leader, county agent, and county superintendent of schools.
2. Call a meeting of parents to talk over club work. Have State leader present.
3. Call a meeting of interested boys and girls to discuss club work and things needed for membership.
4. Hold organization meeting and organize club before November 1.
5. Use the printed follow-up instructions furnished. Too much literature destroys the interest for the rest of the year.
6. Secure and use the services of the poultry specialist in club work.
7. Requirements for a completed poultry project:
 - (a) Organize and secure local leader before November 1.
 - (b) Each member must—
 1. Have six hens and a rooster.
 2. Have adequate housing facilities.
 3. Keep an egg record, a feed record, and a record of receipts from sales.
 4. Hatch at least 50 chicks before May 15.
 5. Attend all meetings and field meetings of the club.
 6. Prepare a written story of his work.
8. The 4-H emblem is the recognized trade-mark of boys' and girls' club work.
9. Meetings should be held monthly. Meetings should be short. Begin on time and close early. Parents object to having children away from home late at night. See program outline.

**LIST OF PUBLICATIONS RELATING TO POULTRY ISSUED BY ANIMAL HUSBANDRY DIVISION,
BUREAU OF ANIMAL INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE.**

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Standard Varieties of Chickens. (Farmers' Bulletin 51.)
 Poultry Management. (Farmers' Bulletin 287.)
 Pheasant Raising in the United States. (Farmers' Bulletin 390.)
 Capons and Caponizing. (Farmers' Bulletin 452.)
 Hints to Poultry Raisers. (Farmers' Bulletin 528.)
 Important Poultry Diseases. (Farmers' Bulletin 530.)
 Boys' and Girls' Poultry Clubs. (Farmers' Bulletin 562.)
 Poultry House Construction. (Farmers' Bulletin 574.)
 Natural and Artificial Incubation of Hen's Eggs. (Farmers' Bulletin 585.)
 Natural and Artificial Brooding of Chickens. (Farmers' Bulletin 624.)
 Simple Trap Nest for Poultry. (Farmers' Bulletin 682.)
 Squab Raising. (Farmers' Bulletin 684.)
 Duck Raising. (Farmers' Bulletin 697.)
 Goose Raising. (Farmers' Bulletin 767.)
 Turkey Raising. (Farmers' Bulletin 791.)
 Mites and Lice on Poultry. (Farmers' Bulletin 801.)

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.

Guinea Fowl and Its Use as Food. (Farmers' Bulletin 234.) Price, 5 cents.
 Successful Poultry and Dairy Farm. (Farmers' Bulletin 355.) Price, 5 cents.
 Commercial Fattening of Poultry. (Department Bulletin 21.) Price, 10 cents.
 Digestion Experiments with Poultry. (Bureau of Animal Industry Bulletin 56.) Price, 20 cents.
 White Diarrhea of Chicks, with Notes on Coccidiosis in Birds. (Bureau of Animal Industry Circular 128.) Price, 5 cents.
 A System of Poultry Accounting. (Bureau of Animal Industry Circular 176.) Price, 5 cents.

CIRCULARS FOR MONTHLY FOLLOW-UP INSTRUCTIONS

January.....How to set a hen and care for her.
February.....Feeding and care of chicks.
March.....How to build a brood coop.
April.....(a) Lice and mites on poultry.
 (b) Produce the infertile egg.
 (c) Packing eggs in water glass.
May.....Care of growing chicks during warm weather.
June.....Marketing old stock and broilers.
July.....Capon and caponizing.
August.....Preparing birds for the show.
September.....Common poultry diseases.
October.....Feeding and housing winter layers.
November.....Trap nests for layers.
December.....Selection and care of breeding stock.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST.
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**COMMON POULTRY DISEASES.**

Prepared in the Animal Husbandry Division, Bureau of Animal Industry, United States Department of Agriculture.

While it is often possible to prevent disease to a great extent by keeping the fowls as well as their houses and surroundings clean and sanitary, nevertheless in practically every flock fowls from time to time contract some disease or disorder that interferes with their growth or production.

In most instances it is not practicable to attempt to cure one or two sick fowls, for even though they are apparently cured, their value as producers or breeders will be lessened, or the disease may reappear and endanger other fowls. It is advisable to attempt a cure only when the disease is common throughout a flock, or in case of a fowl which is very valuable and an effective cure seems probable.

GENERAL PREVENTION.

Other than by keeping the poultry house, drinking fountains, hoppers, and surroundings clean and sanitary, healthy fowls in a flock may be prevented from catching disease by immediately removing those that show signs of disease. In this case, it is well to give the flock an antiseptic, such as potassium permanganate in the drinking water, as described under roup, and to spray and clean the houses and appliances thoroughly with a 10 per cent solution of crude carbolic acid or some coal-tar product in water.

Usually a fowl that is not well can be told by the fact that it is not as active as the others, stands around in an out-of-the-way place, and shows little disposition to eat. Such a fowl should be immediately removed from the flock and if seriously sick should be killed and the carcass burned rather than buried.

COMMON DISEASES, SYMPTOMS, AND TREATMENT.**ROUP.**

Roup is a highly contagious disease, spreading from one bird to another very quickly. The disease is very common in the fall, especially in poorly ventilated, damp houses. (Fig. 1.)

Treatment.—Remove the sick birds to a warm, dry, well-ventilated room that is free from drafts. Syringe the nostrils, by means of a medicine dropper, with a solution of 1 teaspoonful



FIG. 1.—A fowl with roup.

of common salt to a quart of water. The eyes may be bathed gently with the same solution. Grease around the nostrils and eyes with pure or carbolated vaseline. Dissolve in each gallon of drinking water as much potassium permanganate as will remain on the surface of a dime. The flock should have no other drinking water than that containing potassium permanganate. It is good practice to use potassium permanganate in the drinking water as a preventive as soon as the cool weather begins in the fall.

CANKER.

This disease causes cheese-like patches to form in the membrane of the mouth and tongue.

Treatment.—Sprinkle a little sulphur in the mouth and throat of the bird. Another effective treatment consists of washing the sore patches with a mixture of equal parts of hydrogen peroxid and water.

CHOLERA.

This is probably one of the worst diseases that affect poultry, for it spreads rapidly and in most cases the cure is unsatisfactory. The usual symptoms of cholera are as follows: The fowl is troubled with diarrhea, the droppings become watery and yellow or green in color; the fowl is depressed; the feathers ruffled; and the comb is either very pale or very dark. Fowls affected with cholera usually have a great thirst but poor appetite. Frequently many so-called cases of cholera are simply diarrhea. Fowls having cholera usually die within 36 hours.

Treatment.—The most satisfactory method of combating this disease is to kill and burn all fowls that are really affected. Clean and spray all water fountains and the houses thoroughly with a 10 per cent solution of carbolic acid and water or one of the coal-tar products and water. The droppings should either be buried deep, burned, or sprayed with the above solution.

LIMBER NECK.

This disease is characterized by the fact that the fowl's neck is limp and can not hold the head erect. The disease is a form of food



FIG. 2.—A bad case of wry neck.

poisoning, and is caused by the fowl's feeding on decomposed animal flesh. (Fig. 2.)

Treatment.—Two teaspoonfuls of castor oil given to the fowls will sometimes cure them. In all cases an effort should be made to find the cause of the disease, which is usually a dead animal or fowl that has decomposed and is being eaten by the birds. All carcasses should be deeply buried or burned when found.

CHICKEN POX, OR SORE HEAD.

This as a very contagious disease that occurs in all classes of poultry. It may be told by the yellow patches or nodules that appear about the beak, face, and comb.

Treatment.—Cover the sore patches with carbolated vaseline, or if this is not effective, apply a touch of iodine.

WHITE COMB, OR FAVUS.

The general symptom of this disease are white or grayish spots that form on the comb, wattles, ear lobes, and other parts of the body. It spreads from one fowl to another, and birds so affected should be removed from the flock. (Fig. 3.)

Treatment.—When the disease affects only the bare parts of the head and face, it can sometimes be cured by applying iodine. Another effective remedy is that of applying an ointment composed of 1 part of powdered sulphur mixed with 9 parts of carbolated vaseline. In applying this the affected parts should be merely anointed and not rubbed over, as rubbing tends to spread the disease. Repeated applications should be made every three days until the affection disappears. If the feathered portions of the body are affected, it is better to kill the fowl, as it usually requires considerable time to effect a cure.

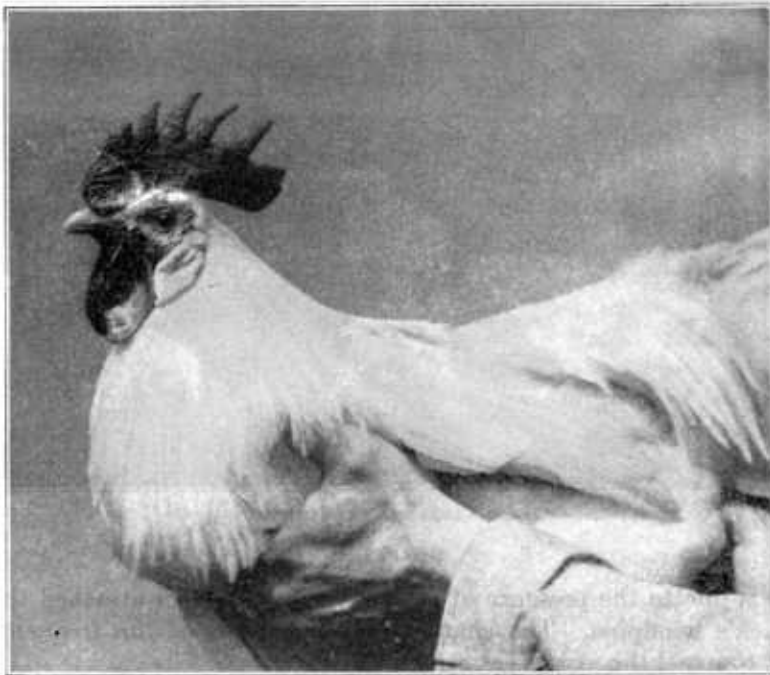


FIG. 3.—White Leghorn cockerel with favus, or "white comb."

FROZEN COMB.

Frozen or frostbitten combs frequently occur in cold weather, especially with birds having large single combs. Fowls having lopped single combs or rose combs are not so susceptible, due principally to the comb being closer to the head.

Treatment.—Applying snow or cold water to frozen combs before they thaw will frequently save them. If they are thawed by this method vaseline should be applied to the frozen parts at least once a day for several days.

DIARRHEA IN HENS.

Diarrhea is usually caused by a change in the quality or quantity of food, excessive green or meat food, and very hot weather. One of the best cures is to deprive the fowl of all green or meat foods, and wet mash, and feed a dry mash and grain feed. A teaspoonful of castor oil or sweet oil, with five drops of oil of turpentine added, will frequently check the trouble.

WHITE DIARRHEA.

This is probably the most dreaded of chick diseases, it being very contagious and fatal in its results. It can easily be told by the fact that the chicks tend to droop their wings, are sleepy in appearance, and show little or no desire to eat; assume almost a ball shape; and the whitish-brown droppings adhere to the vent and fluff, causing them to become "pasted up behind." (Fig. 4.)

Treatment.—Chicks that have reached the advanced stages of this disease should be removed, killed, and burned.

Ten grains of permanganate of potash should be added to each gallon of drinking water and kept before the chicks until they are at least 4 weeks old.

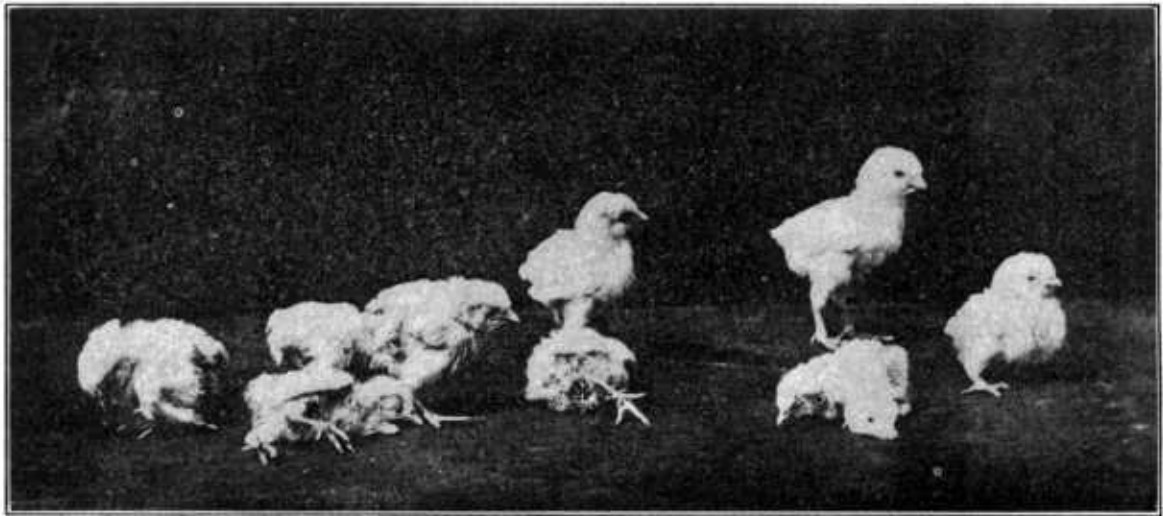


FIG. 4.—Chicks with white diarrhea.

GAPES.

This trouble is due to the presence of small worms that have attached themselves to the inside of the chick's windpipe. The characteristic symptom is the frequent gaping of the chick in its effort to expel the worms.

Treatment.—Due to the fact that gapeworms are usually found on ground that has been used for some time as a range for poultry, the best remedy is to remove the chicks to a new range. The ground so infected should be thoroughly limed and plowed and not used for young chicks for at least two seasons. As an individual treatment, the worms can oftentimes be removed by means of a looped horsehair. Good results have been obtained by adding 15 grains of salicylic acid to each quart of drinking water.

CROP BOUND.

This disorder is caused by the crop becoming overloaded with feed to such an extent that the muscular walls become partially paralyzed and thus unable to work off the accumulated food. The trouble can be told by the fact that the crop is hard and firm and protrudes noticeably.

Treatment.—Ordinarily this trouble can be overcome by pouring half an ounce of melted lard or sweet oil down the throat and working the crop with the hand, so as to allow the oil or lard to mix with the feed. When this is done, the food will usually pass away in a few hours.

SCALY LEG.

This is most frequently found among old fowls and is caused by small mites that burrow under the scales of the shanks and feet and there multiply in numbers. (Fig. 5.)

Treatment.—Most often kerosene applied to the fowl's legs and feet will be found an effective remedy.

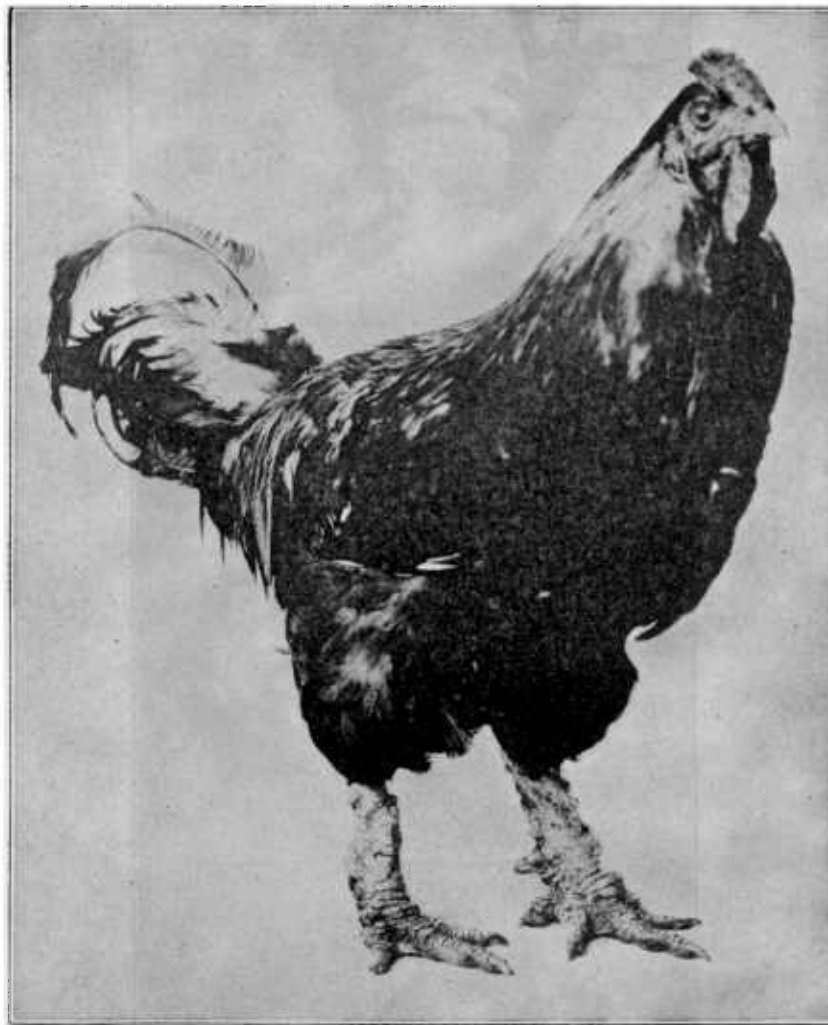


FIG. 5.—A male bird affected with scaly leg.

BUMBLE FOOT.

Bumble foot is caused by bruises forming on the bottom of the feet, usually due to the fowls jumping from high roosts to a hard floor. To remove the cause, lower the roosts. When the foot is badly swollen, a small cut should be made with a clean, sharp knife, and the pus

removed. Wash the wound out with equal parts of hydrogen peroxid and water, grease with vaseline, and bandage with a piece of cloth. (Fig. 6.)



FIG. 6.—A case of bumble foot.

NOTE.—This is one of a series of follow-up circulars on poultry (the K series) printed for the exclusive use of club members and club leaders. Other persons desiring poultry literature should write to their State agricultural college or ask for the bulletins noted on the next page.

LIST OF PUBLICATIONS OF U. S. DEPARTMENT OF AGRICULTURE RELATING TO POULTRY.

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Standard Varieties of Chickens. (Farmers' Bulletin 51.)
 Poultry Management. (Farmers' Bulletin 287.)
 Pheasant Raising in the United States. (Farmers' Bulletin 390.)
 Capons and Caponizing. (Farmers' Bulletin 452.)
 Hints to Poultry Raisers. (Farmers' Bulletin 528.)
 Important Poultry Diseases. (Farmers' Bulletin 530.)
 Boys' and Girls' Poultry Clubs. (Farmers' Bulletin 562.)
 Poultry House Construction. (Farmers' Bulletin 574.)
 Natural and Artificial Incubation of Hens' Eggs. (Farmers' Bulletin 585.)
 Natural and Artificial Brooding of Chickens. (Farmers' Bulletin 624.)
 Simple Trap Nest for Poultry. (Farmers' Bulletin 682.)
 Squab Raising. (Farmers' Bulletin 684.)
 Duck Raising. (Farmers' Bulletin 687.)
 Goose Raising. (Farmers' Bulletin 767.)
 Turkey Raising. (Farmers' Bulletin 791.)
 Mites and Lice on Poultry. (Farmers' Bulletin 801.)
 Standard Varieties of Chickens. I. The American Class. (Farmers' Bulletin 806.)

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.

Guinea Fowl and Its Use as Food. (Farmers' Bulletin 234.) Price, 5 cents.
 Commercial Fattening of Poultry. (Department Bulletin 21.) Price, 10 cents.
 White Diarrhea of Chicks, with Notes on Coccidiosis in Birds. (Bureau of Animal Industry Circular 126.) Price, 5 cents.
 A System of Poultry Accounting. (Bureau of Animal Industry Circular 176.) Price, 5 cents.



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**SUGGESTIONS FOR BOYS' AND GIRLS' EXHIBITS****(AT LOCAL, COUNTY, AND STATE FAIRS).**By MILTON DANZIGER, *Field Agent in Club Work.*

The rapid development of boys' and girls' agricultural and home-making club work calls for a careful planning of annual exhibits and the management of local club fairs. The boys' and girls' fair should aim to provide the club member with a place for making the required exhibits. Prizes or premiums should not be the reason for inviting the members' participation in the event, but the pride in showing the quality of club products and the setting of higher standards of club achievements in the community or county.

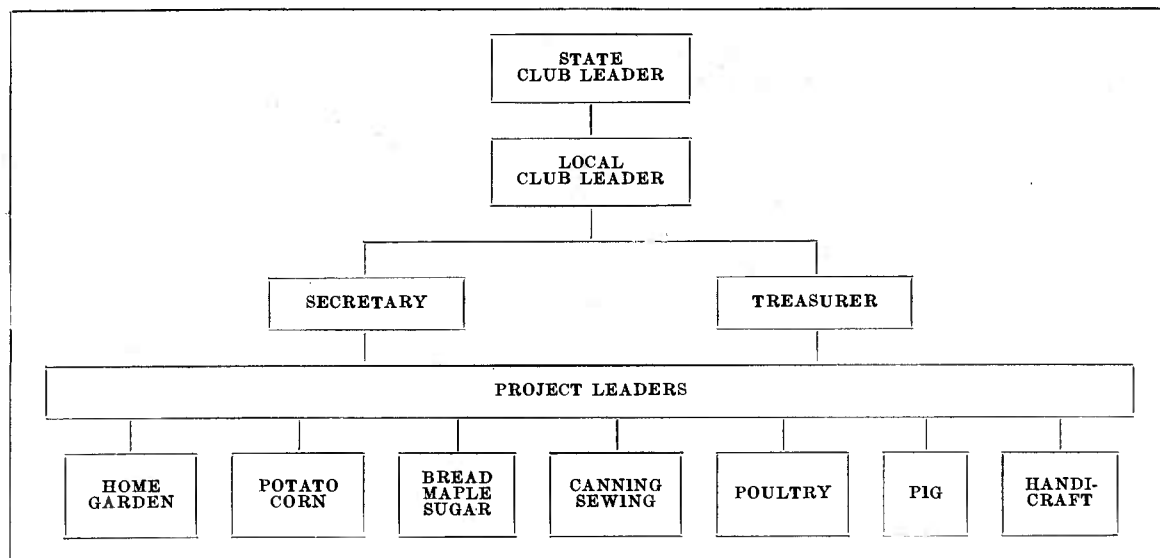


FIG. 1.—Organization of leaders for local club fair.

Club fairs are also an effective means for interesting the older people in the work of the boys and girls in agricultural achievements, and they furnish for both old and young educational values illustrating what the community and home may do in a better and more profitable way. The fair shows not only what has been done, but what may be done.

Boys' and girls' club exhibits, when properly handled, re-create themselves; they satisfy the desire of the boys and girls in their boundless energy to express themselves in terms of achievement, practical education, demonstration, efficiency, cooperation, and contest.

ORGANIZATION.

The organization of a club fair should begin in the early winter and the plans should be completed by spring, so that exhibitors may have time to prepare their exhibits and the officers may have ample time to complete all plans and execute them before it is too late. The fair should aim to develop business efficiency on the part of its club officers; every member of the



FIG. 2.—Proper lighting is as important as sufficient display space.



FIG. 3.—Efficient display equipment may be made from inexpensive material.

club should have some share in its responsibilities. The various departments may be called project sections, to correspond to home projects of members, and members may be assigned as fair-project leaders. Each fair-project leader should be held responsible for his project section and should be accountable for the neatness and arrangement of the exhibits under the general supervision of the secretary or superintendent of club fairs. Boys and girls who have shown efficiency in particular lines of club work should be given positions which will develop their powers of leadership in those lines. Figure 1 shows the relationship of the project leaders to the superior officers.

DISPLAY ROOMS.

The proper display of the exhibits is one of the most important factors for the making of a successful exhibit. Many exhibits lose their effectiveness because they can not be properly studied. The display should attempt to express the individuality of each exhibit. The officers of the club should try to secure a well-lighted, heated room, with plenty of space to lay out all entries. (Fig. 2.) Store buildings, town and lodge halls, and level-floored opera houses make good places.

Portable tables may be made from boards and kept from year to year. The top may be covered with clean paper, bunting, or cheesecloth. Inexpensive cloth around the sides of the display tables will add much to the attractiveness of the general exhibit. For the canning display a stepping rack will show the products to better advantage and save exhibit space. (Fig. 3.)

PUBLICITY WORK.

All successful enterprises depend upon the right kind of publicity. To secure exhibits and exhibitors a well-arranged and attractive premium list is necessary. A supply of handbills left at stores and public places is helpful. An excellent plan is to write letters or invitations to prominent people of the community. Announcements should be made in churches, Sunday schools, public meetings, and other places where people meet in groups.

Editors of newspapers are usually willing to cooperate and should be furnished instructive and interesting material for their publications. Club parades, posters, circulars, and other kinds of printed matter are attractive and helpful in securing the desired public interest in the coming event. A contest in the making of display posters by boys and girls of the club is a good plan and has excellent educational as well as economic value to the membership (fig. 4).

PREMIUM LIST.

The premium list is one of the most important items in connection with a boys' and girls' exhibit. A statement of the objects of the club and the fair and a list of club projects and officers and members should be given. The rules governing the exhibit should be clearly stated.

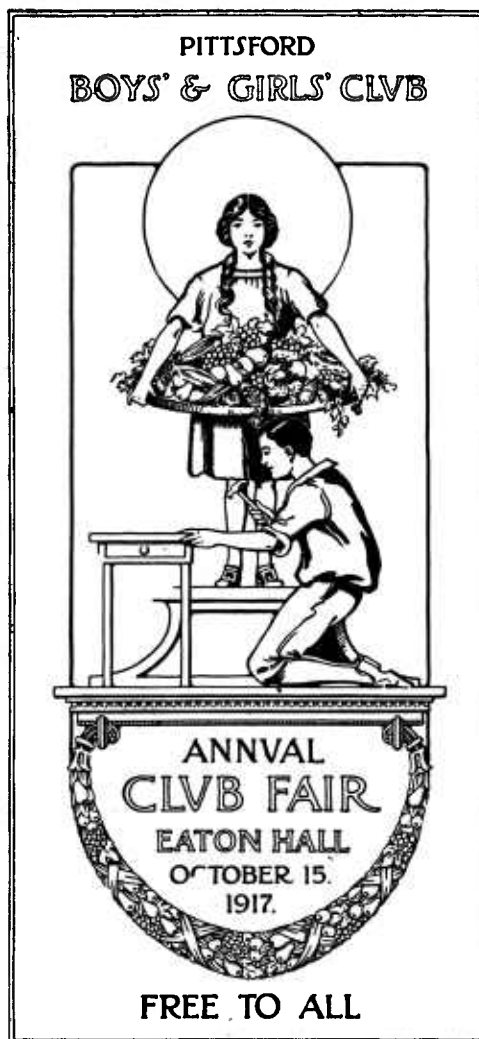


FIG. 4.—A good cover design for club fair circular or premium list, used in Vermont Boys' and Girls' State Club Fair.

It is preferable to give five awards in a class rather than three, by cutting down the prize money. Local club leaders should secure a copy of the standard requirements for exhibits from the State club leaders to conform to standard club projects. Exhibit requirements should be used on a basis of uniformity throughout the State; therefore, requirements in a class should not be changed without consulting the State club leader.

ENTRY BLANK.			
Dear Club Leader:		Date.....	
Please make entries for me at the Pittsford Boys' and Girls' Club Fair, as follows:			
Project.	Class.	Lot No.	Article or animal as in list.
<i>Garden</i>	<i>a</i>	<i>6</i>	<i>Five beets.</i>
<i>Potato</i>	<i>a</i>	<i>4</i>	<i>Twenty Carmen potatoes.</i>
<i>Canning</i>	<i>b</i>		<i>Sixty-five jars fruit, vegetables, and greens.</i>
<i>Poultry</i>	<i>a</i>		<i>One Rhode Island Red hen.</i>
<i>Pig</i>	<i>b</i>		<i>One pig under 6 months of age.</i>
<div style="text-align: right; margin-right: 100px;">Name.....</div> <div style="text-align: right; margin-right: 100px;">Address.....</div> <div style="text-align: right; margin-right: 100px;">Name of Club.....</div> <div style="margin-top: 20px;"> <div style="display: inline-block; width: 150px; border-bottom: 1px dotted black;"></div> <div style="display: inline-block; vertical-align: bottom;">Club Leader.</div> </div>			

FIG. 5.—Entry blank may contain 10, 15, or 20 lines.

The premium list should be distributed as early as possible to acquaint exhibitors with the classes of exhibits, so they can properly prepare for them.

ENTRY BLANKS.

Entry blanks will be found very convenient for use in making entries, as exhibitors may prefer to leave a list of entries they desire to make rather than wait while they are being made. Besides this, more accuracy can be secured and responsibility for mistakes can always be traced if the entries are written out by the exhibitor on an entry blank. If enclosed in premium lists sent out, they will be appreciated by exhibitors who wish to send in entries by mail (fig. 5).

CERTIFICATION.

There are four classes of club membership in the State club work, and it is necessary that the exhibitors conform to the age requirements in making entries for exhibits, as follows:

Active: 10 to 18 years, inclusive.

Associate: Under 10 years of age.

Demonstrators: Members over 18 years of age who are given honorary membership for meritorious club work but can not compete for prizes in exhibits or contests.

All-star members: Champion members who have passed the age requirement but are eligible to enter all contests irrespective of their age but can not compete for prizes.

<p>Dear Club Leader:</p> <p>I hereby certify that is years of age and eligible to compete at the Pittsford Boys' and Girls' Club Fair.</p> <p>Very truly, yours,</p> <p style="text-align: right;">Name.....</p> <p style="text-align: right;">Address.....</p> <p style="text-align: right;">Title.....</p> <p>Approved: Club Leader.</p>	<p>Date.....</p> <p>(Parent, guardian, or teacher.)</p>
--	---

FIG. 6.—Form for age certification.

Contests may be open for prize competition to active and associate members, and ribbons of "special mention" may be given to demonstrators and all-star members. It is necessary that all exhibitors be certified as to age (fig. 6).

It is advisable to have club members certify that all exhibits were made by themselves and have not been entered for a prize at the club fair at a previous contest (fig. 7).

ENTRY BOOKS.

An accurate, convenient, and simple entry system is very essential. One confused or mistaken entry will cause the club leader and secretary much unnecessary trouble and the exhibitors a great deal of dissatisfaction. For a small exhibit, single-page entry sheets are more convenient. These pages can be bound into books or left as sheets; books are preferable, however. Only the club leader or secretary (if the latter is not competing) should have access to this book until after the judging is completed (fig. 8).

ENTRY TAGS.

Entry tags should be small, so as not to interfere with the judging nor detract from the exhibits. In a small contest these can often be written instead of printed. One good form is shown herewith. The tag should be strong enough to stand wear and removing and should be tied and *not* glued or sewed to exhibits (fig. 9). The exhibitor's name should never be put on until the judges have finished.

Date.....

Dear Club Leader:

I hereby make application to exhibit at the Pittsford Boys' and Girls' Club Fair, and I certify that all my exhibits have been made, grown, or raised by me without the assistance of an adult during the club year of 19..., and have not been entered for a prize at a previous contest of the Pittsford Fair.

Very truly, yours,

Name.....
Address.....
Name of Club.....

Approved:
.....
Club Leader.

FIG. 7.—Form for member's certification.

Page 1.

Project: *Sewing.* **Class** *b.*

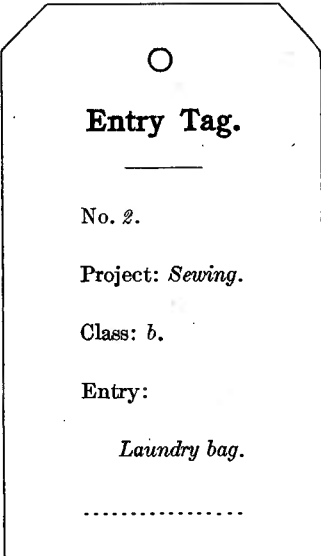
Article: *Laundry bag.*

Entry No.	Name.	Address.	Rank.	Premium won.
1	<i>John Jones.</i>	<i>Florence.</i>	<i>3</i>	<i>50 cents.</i>
2	<i>Mary Smith.</i>	<i>Pittsford.</i>	<i>1</i>	<i>\$1.00.</i>
3	<i>Bess Brown.</i>	<i>Proctor.</i>	<i>2</i>	<i>75 cents.</i>
4	<i>Ben Black.</i>	<i>Pittsford Mills.</i>	<i>5</i>	<i>25 cents.</i>
5	<i>Hazel White.</i>	<i>Rutland.</i>	<i>4</i>	<i>25 cents.</i>
6	<i>Ruth Green.</i>	<i>Pittsford.</i>		<i>Special mention.</i>
7				
8				
9				

FIG. 8.—Form for entry sheet or book.

DISPLAY CARDS.

A small, neat display card as shown herewith (fig. 10), can take the place of the entry tag after the judges have finished and will add much to the attractiveness of the exhibit.



○

Entry Tag.

No. 2.

Project: *Sewing.*

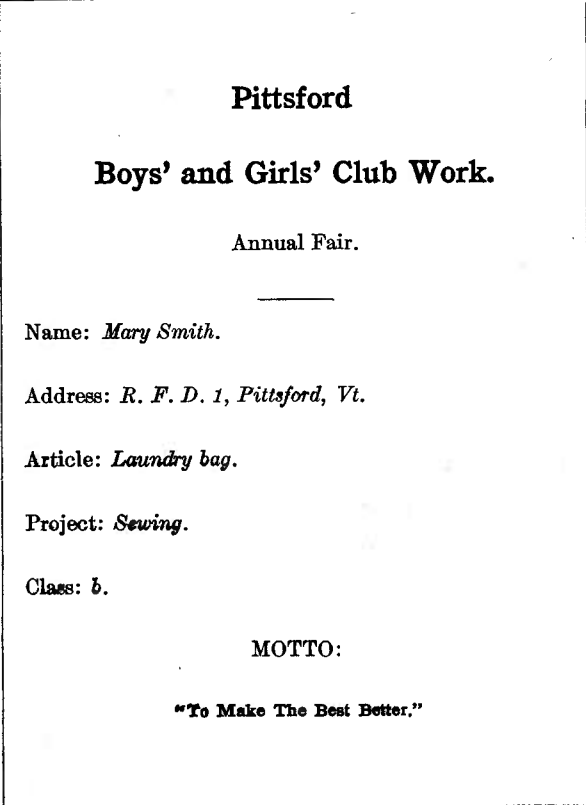
Class: *b.*

Entry:

Laundry bag.

.....

FIG. 9.—Form for entry tag $1\frac{1}{2} \times 3$ in.



Pittsford

Boys' and Girls' Club Work.

Annual Fair.

Name: *Mary Smith.*

Address: *R. F. D. 1, Pittsford, Vt.*

Article: *Laundry bag.*

Project: *Sewing.*

Class: *b.*

MOTTO:

"To Make The Best Better."

FIG. 10.—Form for display card.

JUDGING.

Competent judges are necessary for a successful contest. Judges should not merely place the awards but should give the reasons for their placing to the exhibitors present and suggest methods of improvement. They should be selected for their fitness to judge and should also be ready to answer questions that may be asked. The judge's discussion and explanation or reasons for "placing" should be one of the best educational features of the contest. Blank forms or a book should be furnished the judges in which to make their awards so that they may become a part of the records of the club and be kept on file (fig. 11).

Page one.	
AWARDS.	
Project: <i>Sewing Class: b.</i>	
Article: <i>Laundry bag.</i>	
First award No.....	2
Second award No.....	3
Third award No.....	1
Fourth award No.....	5
Fifth award No.....	4
..... award No.....	
Honorable mention No.....	6
Special mention No.....	
Sweepstakes No.....	
Name of judge:	

FIG. 11.—Form for award sheet or book for judges.

RIBBONS.

Ribbons should be printed, giving the name of the contest, the place, the date, and the prize won (fig. 12). To further designate the class to which the prize belongs, different-colored ribbons are used. The ribbons should be given in addition to the premiums, for club members prize them highly, not only as a token of award but as a souvenir of the contest. It would be well if uniform colors were used throughout the State, as exhibitors would then soon become accustomed to them. The following colors have been used and might well be adopted for club fairs:

- | | |
|---------------|-----------------|
| 1. Dark blue. | 6. Maroon. |
| 2. Red. | 7. Lilac. |
| 3. White. | 8. Nile green. |
| 4. Pink. | 9. Yellow. |
| 5. Brown. | 10. Light blue. |
- Sweepstakes—Royal purple.

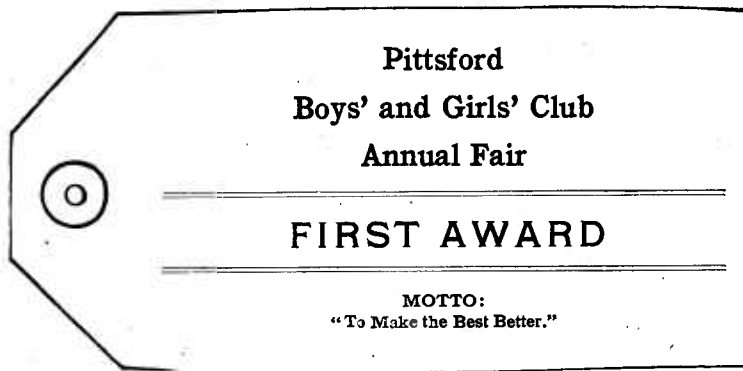
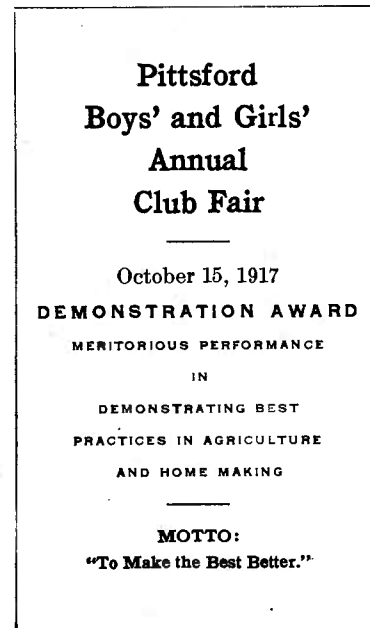


FIG. 13.—Form for premium award card.

FIG. 12.—Form for award ribbon. Size, $2\frac{1}{2}$ x 8 in.FIG. 14.—Form for award ribbon. Size, $2\frac{1}{2}$ x 8 in.

Name of Exhibitors.	No.	Page.
<i>Allison, Arthur</i>	28	9
<i>Alvarado, Alice</i>	17	8
<i>Black, Ben</i>	5	7
<i>Brown, Bess</i>	2	6
<i>Calkins, Clara</i>	26	10
<i>Chalmers, Charles</i>	10	4
<i>Chadwick, Carrie</i>	8	3

FIG. 15.—Form for statement index.

PREMIUM CARDS.

If ribbons are not obtainable, premium-award cards can be purchased and printed for \$3 to \$5 per thousand. Although they are not as desirable as award ribbons, they are economical and can serve from year to year. The stock from which they are made should be of good weight, durable, the design and colors attractive. The same color designation as the ribbons should be used (fig. 13).

PREMIUMS.

Premiums are of vital importance in a contest. While the prize should not be the chief motive to bring out club members for exhibiting, yet good serviceable premiums are the best kind of inducement to bring out good entries. Federal and State funds for extension work in agriculture and home economics are not always available for prizes, premiums, and awards. District, county and State fair associations, business men, chambers of commerce, boards of trade, granges, individuals, and institutions usually provide the premiums.

Large cash prizes to one or a few individuals are injurious to the work rather than helpful. Small awards, with the idea of giving recognition for definite standards of achievement to many instead of the few, should be the object. Useful kitchen equipment, household furniture, farm implements, poultry and stock devices of all kinds are always commendable, looking, of course, toward reinforcement of the particular work in which club members or groups of members make their records.

Tuition and expenses to agricultural short courses, State, district, and county fairs, summer camps, etc., may be offered, with the distinct idea of giving education through the winners and training the members for local leadership in order that the member may return to the home community better prepared to serve the entire club group and community, the prizes should always be in proportion to the achievement and should be clearly beneficial and of definite educational value.

JUDGING CONTESTS AND DEMONSTRATIONS.

The club fair should be "live." It should represent the all-around interests of club work. A series of judging contests in the various club projects should be held, and the club leader would do well to secure the services of a specialist to give his reasons for placings, so that the contestants may benefit from one who has expert knowledge of a subject.

Demonstrations by club-demonstration teams should be given in all projects and in connection with the products exhibited. They add much to the educational value of the fair. As demonstrations may not be competitive, each demonstrator should be given a demonstrator's ribbon (fig. 14). "Achievement" talks by the club members and illustrated lectures by the State or local leaders and extension workers from the State agricultural college will be found helpful and will add much to the life of the fair.

ACCOUNTS AND RECORDS.

It is quite important that the people and institutions who give money and prizes shall know how they have been distributed, and it will greatly enhance the popularity and usefulness of the club fair if an accurate record is kept of all funds received and expended. An index of exhibitors should be made, so that at any time, by reference to this index, the page where the former award of any exhibitor has been placed, can be readily found (fig. 15). Forms for a letter of subscription and a letter of acknowledgment are suggested in figures 16 and 17.

The officers of the club should keep a record book of the fair containing all business proceedings, account books, scrap book for all printed matter, receipt books, and blank books. Receipts should be taken for all supplies purchased.

Date.....

Dear Club Leader:

I believe in boys and girls and what they are trying to do in club work. I shall be pleased to donate for prizes for the Pittsford Boys' and Girls' Annual Club Fair.

Sincerely,

Name.....

Address.....

FIG. 16.—Form to use in subscription for prizes.

City....., State.....

Date.....

Mr.....,

.....

Dear Mr.

I thank you on behalf of the members of the Pittsford Boys' and Girls' Club for your donation of to be used as prizes for our annual fair and your interest in our behalf. With best wishes,

Sincerely,

....., Club Leader.

FIG. 17.—Acknowledging letter.

(Issued September 7, 1917.)

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U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
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STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.**INSTRUCTIONS TO LOCAL LEADERS OF BOYS' AND GIRLS' HOME GARDEN AND CANNING CLUBS.**

By GEORGE E. FARRELL, *Assistant in Boys' and Girls' Club Work.*

If you are contemplating the organization of home-garden and home-canning clubs in your community, do some preliminary work before mentioning it to the boys and girls: (1) Write to the State club leader, at the State agricultural college, telling what you are planning to do, and ask him what he can do to assist you. The State club leader is employed jointly by the State agricultural college and the U. S. Department of Agriculture, and represents both institutions. (2) If you have a county agent in your county, invite him to cooperate with you in making plans for the work. (3) Write the county superintendent of schools and secure his cooperation.



FIG. 1.—Omega Garden Club boys, "Soldiers of the Commissary Army," in hoe drill before starting the day's work.

When you have received replies from these persons, call together eight or ten interested people, and with them make plans for a public meeting of adults and children. This meeting should be well advertised and the purpose plainly stated. If you desire the services of the State club leader for this meeting, arrangements should be completed with him, a month in advance. Request for the services of the county agent or county superintendent of schools should be made two weeks in advance. A successful club leader or member from a neighboring club will strengthen this program. A miscellaneous program presenting many subjects will defeat the purpose of this meeting. At the close of the meeting, request all those interested in the garden and canning club work to assemble on the front seats for further discussion. Secure the name and address of parents and children who remain for this discussion. These preliminary arrangements should be completed early in the winter.

THE STATE LEADER, ASSISTANTS, AND SPECIALISTS.

The State club leader and assistants will assist the local community to plan the program for the year; will supply the club with blank forms, printed follow-up instruction, and special training for the local leader. A specialist in garden work will assist in follow-up work and will train the local leader in subject matter.



FIG. 2.—Club plats and members need personal visits, help, and encouragement from local leaders and garden specialists.

PRELIMINARY MEETING.

Call together the boys and girls between the ages of 10 and 18 years, inclusive, who have expressed a willingness to join the garden and canning club, and explain to them the requirements for membership in the club as follows:

Each club member must—

1. Plant and care for a home garden.
2. Attend club meetings, field instruction tours, exhibits, demonstrations, and festivals.
3. Can the surplus for winter use.
4. Make an exhibit.
5. Assist in public demonstrations.
6. Keep complete records of receipts and expenditures on project.
7. Execute faithfully the follow-up instructions.

ORGANIZATION MEETING.

Before the garden and canning club is organized, each member should be required to sign the pledge card, and to have his plat of ground. The following officers should be selected: President, vice president, and secretary-treasurer. The secretary-treasurer should prepare at once a list of officers and members and mail it immediately to the State club leader.

RECORDS.

There are two general methods of keeping project records: (1) The member keeps in his notebook the record for the entire year and reports to the local leader; or (2) the member keeps a record and reports to the secretary-treasurer receipts and expenditures at each club meeting.

UNIFORMS.

The four-leaf clover with the four H's upon the leaves has come to be the recognized emblem of boys' and girls' club work. It represents a large and growing national fraternity that is known and recognized throughout the United States. For demonstration work each club member should have a club uniform displaying the club emblem.



FIG. 3.—Every garden club plat should have a club sign.

CLUB MEETINGS.

A program for each club meeting should be prepared in advance, and should be divided into three parts, as follows: 20 minutes for business session; 40 minutes for study and discussion of subject matter; 30 minutes for play, contest, and recreation. The meeting should adjourn promptly. It is a mistake to keep children away from home long, or to continue the meeting until a late hour. Meetings should convene and adjourn as promptly as a school, so that parents may know when the children are expected to go and when they may expect them to return.

The following series of program will be suggestive:

FEBRUARY.

1. (Twenty minutes.) Organization of club; election of officers; local leader instructs officers in duties. Report from club members; (a) signing of pledge card; (b) home garden plat.
2. (Forty minutes.) Study and discussion of subject matter. Explanation of club requirements by local club leader: (a) attendance at meeting by club member; (b) record to be kept by club member; (c) membership in demonstration team; (d) improving soil fertility and tilth; (e) planning gardens. (In a well-conducted meeting, the club members do most of the talking.)
3. (Thirty minutes.) Play contests and club recreation. Planning and practicing games related to garden work.

MARCH.

1. (Twenty minutes.) Roll call; report of members to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Planning the garden for succession of crops. Each member makes a "layout." Proper varieties to plant. Seed boxes; transplanting.
3. (Thirty minutes.) Lunch—cocoa and sandwiches.

APRIL.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Spading or plowing; fertilizing; early crop vegetables; training demonstration team; inspect plant diseases; spraying.
3. (Thirty minutes.) Guessing contests. Each member to describe a garden plant or product without naming; others to guess name and variety.

MAY.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries. Four-hour (afternoon) field instruction by club tour; (a) plotting a garden; (b) freedom from weeds; (c) straight rows; (d) cultivation; (e) drainage; (f) box-plant hardening.
2. Camp or picnic supper—fresh vegetables, sandwiches, outdoor games.

JUNE.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Demonstration on home canning by demonstration team.
3. (Thirty minutes.) Discussion of the demonstration and equipment for home canning.

JULY.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Demonstration by club team; drying of vegetables.
3. (Thirty minutes.) Making demonstration aprons and caps—one set of white the other of khaki cloth.

AUGUST.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Discussion of plans for exhibit; making premium list; demonstration team; judging team; canning difficulties.
3. (Thirty minutes.) Three-minute stories by members; "The Most Interesting Thing About My Garden."

SEPTEMBER.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Marketing garden produce; grading, bunching, washing, canning; 4-H brand labels.
3. (Thirty minutes.) Canning recipes to be given out; training for contest in apple or potato paring.

OCTOBER.

1. (Twenty minutes.) Roll call; report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Discussion of premium list; preparation of exhibit; club judging contest.
3. (Thirty minutes.) Potato-paring contest.

NOVEMBER.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries.
2. (Forty minutes.) Storage of root and tuber vegetables for winter use; season's report to State club leader; story of "How I Made My Crop."
3. (Thirty minutes.) Club feast—home canned and dried food products.

DECEMBER.

1. (Twenty minutes.) Roll call; members report to secretary; exhibit of record book and discussion of entries; season's report turned over to secretary.
2. (Forty minutes.) Four-minute stories by members on "Successes and Failures in Garden and Canning Work." Election of new members to the club for the coming year.
3. Reception to new members; refreshments.

ACHIEVEMENT DAY.

Address—Youth Achievement in Education. By a business man who can inspire, entertain, and give a real message.

Address—Gardening as a Hobby. By a gardener-business man.

Address—Home Canning to Eliminate Waste. By a club member.

Three-minute speeches (five) by club members.

Awarding of achievement medal. By a local club leader, county superintendent of schools, county club leader, or State club leader.

SUMMER CLUB FESTIVAL.

Saturday, July 23, 1916. Center's Grove.

10.00 a. m.—Garden and canning club pageant.

10.45 a. m.—Report of progress by local group leaders and stories of achievement by members.

12.00 p. m.—Picnic dinner by club groups.

1.15 p. m.—Fifty-yard dash, boys under 13.

Fifty-yard dash, girls under 13.

Fifty-yard dash, boys over 13.

Fifty-yard dash, girls over 13.

Potato relay, 4-man team, one-fourth mile.

Potato-paring contest, 6 potatoes. (Speed 25, skill 25, waste 50.)

Needle-threading contest, 7 needles. (Remove thread from spool and knot.) (Speed 30, skill 30, quality 40.)

2.30 p. m.—Ball game, 7 innings, Reds v. Blues.

3.30 p. m.—Canning and drying recipe giving contest—one period, cold-pack method to be used in canning. (One from each club; 5 points for each contestant standing at end of contest.)

4.30 p. m.—Gardening and canning spelling contest. 300 words selected from garden and canning literature. One trial; no hesitation; two entrants from each club.

Rules: Five points will be awarded to first in each contest; three points to second, and one point to third, unless otherwise designated.

A 4-H medal or banners will be awarded to the club winning the greatest number of points. A pennant will be awarded for second place, and a pennant for third place.

AUTUMN CLUB AND FAIR FESTIVAL.

September 23–27. School Exhibit Hall.

Club exhibit requirements:

1. All club members are required to exhibit.
2. Only bona fide club members may exhibit.
3. All exhibits must be in the hands of local committee before 9.30 a. m., September 22.
4. Cards will be furnished on which should be written the names and addresses of exhibitors and members of entries for which they intend to compete.
5. No exhibit may be removed before 10 a. m., September 28.
6. All products not removed before 10 p. m., September 28, will be sold and receipts used to defray the cost of the exhibition.
7. An exhibit may be entered in but one class, record books and stories excepted.
8. Ribbons or medals will be granted to first, second, and third prize winners in each class. Bronze 4-H medals will be granted to all who attain the minimum standard determined by committee on awards.
9. All articles must have been grown or produced by exhibitor in whose name they are entered.

EXHIBIT LIST.

1. Four ears sweet corn.
2. Two ears sweet corn and $\frac{1}{2}$ -gallon jar canned sweet corn on cob.
3. Two ears sweet corn, 3 quarts canned corn cut from cob, and record book.
4. Plate of seven potatoes.
5. Half-bushel box of tomatoes.
6. Two 1-quart jars of tomatoes canned whole, plate of seven tomatoes, and club member's record book.
7. Two 1-quart jars of tomatoes canned whole.
8. Pound basket string beans

9. Two 1-quart jar string beans and pound basket of string beans.
10. Pound basket of string beans, two 1-quart jars of canned string beans, and record book.
11. Best record book at exhibit.
12. Ten quarts of products, all different, canned in glass.
13. Twelve No. 3 cans of products, one to be opened for test.
14. Greatest variety of canned vegetables and fruit by club member. (All jars below standard in quality will be barred.)
15. Illustrated story of experience in "Home Canning of Surplus."
16. Illustrated story of "How I Made My Garden."
17. Illustrated story of "Experience in Marketing."
18. Canning contest. One bushel of tomatoes to be canned by each team. Judged on speed, skill, quality of product and appearance of pack. (Each team to furnish all equipment, except stove, tables, and fuel.)
19. Best drawing of garden plan.
20. Best exhibit of garden equipment by member.

For further information in regard to basis of award, special home garden instruction, field meetings, demonstrations, demonstration teams, prizes and premiums to be available to club members, and other special features of interest to the home garden and canning club members, request should be made of the State leader in charge of the boys' and girls' extension work, State agricultural college.

When printed circulars and instructions on home gardening and canning are not available from your State college, write to the States Relations Service, Office of Extension Work, North and West, Washington, D. C., for the NR series of home gardening and canning instructions and Farmers' Bulletins 839 and 841

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST,
WASHINGTON, D. C.

BOYS' AND GIRLS' CLUB WORK.

A SIMPLE TRAP NEST FOR POULTRY.

Prepared by the Animal Husbandry Division, Bureau of Animal Industry, United States Department of Agriculture.

A trap nest is a laying nest so arranged that after a hen enters it she is confined until released by the attendant. The use of trap nests is essential in breeding poultry for both egg production and exhibition, where pedigree records are used in selecting either the males or females, and has a place in mass selection for increasing the egg production. Trap nests are of value in weeding out poor layers and increasing the average egg yield of a flock by selecting and breeding, but are not extensively used on account of the large amount of labor required to operate them. Some poultry breeders trap-nest their pullets during their first six months of laying and use this as a basis in selecting their breeders for egg production.

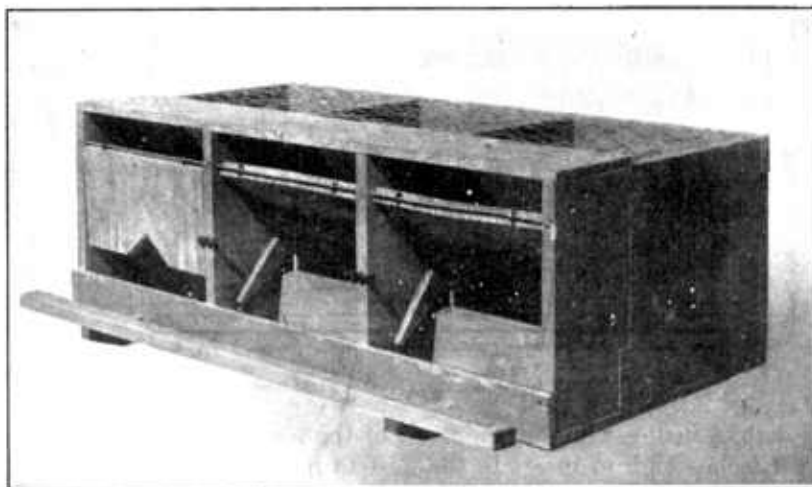


FIG. 1.—A good trap nest for hens.

HOW TRAP NESTS ARE USED.

One nest should be provided for 4 to 5 hens kept in flocks of 50 or more, while more trap nests per hen are necessary in smaller flocks. The hens are banded with numbered bands, and a record is kept of their egg production. The nests should be visited at least three times daily, and preferably four or five times, frequent trips being especially necessary when the hens are laying freely and during hot weather.

The trap nest shown in figure 1 may be attached to the underside of the dropping board, with the front facing the pen and arranged so that it can be easily removed, or it may be placed on the walls of the pen. If the nest is placed under the dropping board, the latter will serve as a top for the nest, and the rear of the nest may be of wire to allow good ventilation in warm

weather. If the nest is placed on the wall, slats or wire should be inserted from the front of the nest to the wall at a sharp angle to prevent the hens from roosting on the nest.

When the hen enters this nest, her back raises the door (*c*) (fig. 2), which releases the catch or trigger (*a*) and allows the door to shut. The catch should be set so that its edge just holds the door, which position is regulated by the screw or nail at the lower inside edge of the catch. A washer should be placed on the screw (*d*) between the catch and the side of the nest to prevent this catch from sticking. The guard (*b*) around the catch keeps the nesting material away from the catch. The length of the catch which supports the door and the triangular notch in the door may be varied slightly for very small or very large hens.

DIRECTIONS FOR CONSTRUCTING A THREE-COMPARTMENT TRAP NEST.

Cut four $\frac{7}{8}$ -inch boards for ends and partitions, 12 inches wide by 19 inches long, enough $\frac{1}{2}$ -inch boards 39 $\frac{1}{2}$ inches long, laid lengthwise, to cover the top, back, and bottom, and 1 strip

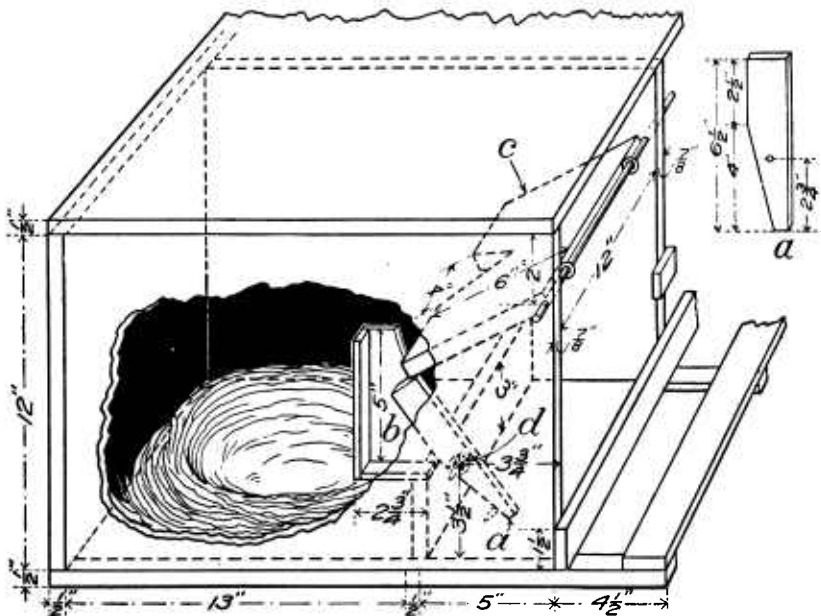


FIG. 2.—Working plans for a trap nest.

39 $\frac{1}{2}$ inches long and 1 $\frac{1}{2}$ inches wide for the front of the nests. Cut 3 pieces of $\frac{1}{2}$ -inch boards 12 inches long and 3 inches high to insert in the nest to hold the nesting material away from the door. Nail the top, back, and bottom to the ends and partitions (see fig. 2), insert the 3-inch strips in the nests, and make the guard (*b*), nailing it to the left side of the nest. Bore a hole in the catch (*a*) large enough so that the catch will move freely when screwed into position on the side. Place a washer on the screw between the catch and the side of the nest. Place a screw at the lower edge of the catch to stop it when set, so that the catch will just hold the door.

Make the doors (*c*) of $\frac{7}{8}$ -inch material, 12 inches by 6 inches, and cut a triangular notch in the center 4 inches wide. Put 2 screw eyes in the top of the doors and bore holes in the front of the nests 2 inches below the top (inside measurement), through which a $\frac{3}{16}$ -inch wire is run to support the doors.

Attach a narrow strip to the front of the nests for the hens to jump upon when entering the nests. Place a button or block of wood on the front of each partition to hold the door when the nest is closed.

If the nests are to be placed directly below the dropping board a wire top should be used on the nest, except for a 5-inch strip of wood on the front edge of the top to stiffen the nest.

NOTE.—This is one of a series of follow-up circulars (the K series) printed for the exclusive use of club members and club leaders. Other persons desiring poultry literature should write to their State agricultural college or ask for bulletins noted below.

PUBLICATIONS OF U. S. DEPARTMENT OF AGRICULTURE RELATING TO POULTRY.

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Standard Varieties of Chickens. (Farmers' Bulletin 51.)
 Poultry Management. (Farmers' Bulletin 287.)
 Pheasant Raising in the United States. (Farmers' Bulletin 390.)
 Capons and Caponizing. (Farmers' Bulletin 452.)
 Hints to Poultry Raisers. (Farmers' Bulletin 528.)
 Important Poultry Diseases. (Farmers' Bulletin 530.)
 Boys' and Girls' Poultry Clubs. (Farmers' Bulletin 562.)
 Poultry House Construction. (Farmers' Bulletin 574.)
 Natural and Artificial Incubation of Hens' Eggs. (Farmers' Bulletin 585.)
 Natural and Artificial Brooding of Chickens. (Farmers' Bulletin 624.)
 Simple Trap Nest for Poultry. (Farmers' Bulletin 682.)
 Squab Raising. (Farmers' Bulletin 684.)
 Duck Raising. (Farmers' Bulletin 697.)
 Goose Raising. (Farmers' Bulletin 767.)
 Turkey Raising. (Farmers' Bulletin 791.)
 Mites and Lice on Poultry. (Farmers' Bulletin 801.)

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.

Guinea Fowl and Its Use as Food. (Farmers' Bulletin 234.) Price, 5 cents.
 Commercial Fattening of Poultry. (Department Bulletin 21.) Price, 10 cents.
 White Diarrhea of Chicks, with Notes on Coccidiosis in Birds. (Bureau of Animal Industry Circular 128.) Price, 5 cents.
 A System of Poultry Accounting. (Bureau of Animal Industry Circular 176.) Price, 5 cents.
 (Issued October 10, 1917.)